

**UNITED STATES DISTRICT COURT
WESTERN DISTRICT OF TEXAS
AUSTIN DIVISION**

Intellectual Ventures I LLC and
Intellectual Ventures II LLC,

Plaintiffs,

v.

VMware, Inc.,

Defendant.

CIVIL ACTION NO. 1:19-cv-01075-ADA

**DECLARATION OF DR. ROBERT AKL, D.SC.
IN SUPPORT OF PLAINTIFFS' CLAIM CONSTRUCTIONS FOR TERMS IN
U.S. PATENT NOS. RE 44,686 AND RE 42,726**

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I, Robert Akl, D.Sc., hereby declare:

I. INTRODUCTION

1. I am over the age of 18 and am competent to make this Declaration. I have personal knowledge, or have developed knowledge, of these technologies based upon my education, training, and/or experience, of the matters set forth herein.

2. I have been retained by counsel for plaintiffs Intellectual Ventures I LLC and Intellectual Ventures II LLC (collectively, “IV”), in the above matter. I am submitting this Declaration to address the meaning and construction of certain disputed terms in U.S Patent No. RE 44,686 (“’686 patent”) and U.S Patent No. RE 42,726 (“’726 patent”). For the purposes of this Declaration, I have not been asked to opine on the meaning of any other disputed terms not addressed below.

II. QUALIFICATIONS AND PROFESSIONAL EXPERIENCE

3. I am an expert in the field of networking systems. I have studied, taught, practiced, and researched this field for over twenty-five years. I have summarized in this section my educational background, work experience, and other relevant qualifications. Attached hereto as Appendix A, is a true and correct copy of my *curriculum vitae* describing my background and experience.

4. I earned my Bachelor of Science degrees in Electrical Engineering and Computer Science *summa cum laude* with a grade point average of 4.0/4.0 and a ranking of first in my undergraduate class from Washington University in St. Louis in 1994. In 1996, I earned my Master of Science degree in Electrical Engineering from Washington University in St. Louis with a grade point average of 4.0/4.0. I earned my Doctor of Science in Electrical Engineering from

Washington University in St. Louis in 2000, again with a grade point average of 4.0/4.0, with my dissertation being on “Cell Design to Maximize Capacity in Cellular Code Division Multiple Access (CDMA) Networks.”

5. While a graduate student, from 1996 through 2000, I worked at MinMax Corporation in St. Louis, where I designed software packages that provided tools to flexibly allocate capacity in a CDMA communications network and maximize the number of subscribers. I also analyzed and simulated different audio compression schemes. I also validated the hardware architecture for an Asynchronous Transfer Mode (ATM) switch capable of channel group switching, as well as performed logical and timing simulations, and developed the hardware architecture for the ATM switch. I also worked with Teleware Corporation in Seoul, South Korea, where I designed and developed algorithms that were commercially deployed in a software package suite for analyzing the capacity in a CDMA network implementing the IS-95 standard to maximize the number of subscribers.

6. After obtaining my Doctor of Science degree, I worked as a Senior Systems Engineer at Comspace Corporation from October of 2000 to December of 2001. At Comspace, I designed and developed advanced data coding and modulation methods for improving the reliability and increasing the available data rates for cellular communications. I coded and simulated different encoding schemes (including Turbo coding, Viterbi decoding, trellis coded modulation, and Reed-Muller codes) and modulation techniques using amplitude and phase characteristics and multi-level star constellations. This work further entailed the optimization of soft decision parameters and interleavers for additive white Gaussian and Rayleigh faded channels.

In addition, I also extended the control and trunking of Logic Trunked Radio (LTR) to include one-to-one and one-to-many voice and data messaging.

7. In January of 2002, I joined the faculty of the University of New Orleans in Louisiana as an Assistant Professor in the Department of Electrical Engineering. While in this position, I designed and taught two new courses called “Computer Systems Design I and II.” I also developed a Computer Engineering Curriculum with a strong hardware-design emphasis, formed a wireless research group, and advised graduate and undergraduate students.

8. In September of 2002, I received an appointment as an Assistant Professor in the Department of Computer Science and Engineering at the University of North Texas (UNT), in Denton, Texas. In May of 2008, I became a tenured Associate Professor in the Department of Computer Science and Engineering. As a faculty member, I have taught courses and directed research in networking and telecommunications, including 2G, 3G, 4G, 5G, CDMA/WCDMA, GPS, GSM, UMTS, LTE, ad-hoc networks, Bluetooth, call admission control, channel coding, communication interfaces and standards, compression, computer architecture, MIMO systems, multi-cell network optimization, network security, packet-networks, telephony, VoIP, Wi-Fi (802.11), 802.15.4, Zigbee, wireless communication, and wireless sensors. I am also the director of the Wireless Sensor Lab (“WiSL”) at UNT. I am a member of the Center for Information and Cyber Security (CICS) and the NSF Net-Centric & Cloud Software & Systems: Industry-University Cooperative Research Center (I/UCRC). Several of my research projects are funded by industry. In January of 2015, I was promoted to Associate Chair of Graduate Studies in the Department of Computer Science and Engineering.

9. In addition to advising and mentoring students at UNT, I was asked to join the faculty of the University of Arkansas in Little Rock as an Adjunct Assistant Professor from 2004 to 2008 in order to supervise the research of two Ph.D. graduate students who were doing research in wireless communications. At UNT, I have advised and supervised more than 250 undergraduate and graduate students, several of whom received a master's or doctorate degree under my guidance.

10. I have consistently received funding from the State of Texas, Texas Higher Education Coordination Board, the National Science Foundation, and industry to design and conduct robotics, video, and mobile gaming (e.g., Xbox, PC, mobile device) programming summer camps for middle and high school students at UNT. By using video and mobile gaming as the backdrop, participants have learned coding and programming principles and developed an understanding of the role of physics and mathematics in video game design.

11. In addition to my academic work, I have remained active in the communication industry through my consulting work. In 2002, I consulted for Input/Output Inc. and designed and implemented algorithms for optimizing the frequency selection process used by sonar for scanning the bottom of the ocean. In 2004, I worked with Allegiant Integrated Solutions in Ft. Worth, Texas to design and develop an integrated set of tools for fast deployment of wireless networks, using the 802.11 standard. Among other features, these tools optimize the placement of Access Points and determine their respective channel allocations to minimize interference and maximize capacity. I also assisted the Collin County Sheriff's Office (Texas) in a double homicide investigation, analyzing cellular record data to determine user location.

12. I have authored and co-authored over 90 journal publications, conference proceedings, technical papers, book chapters, and technical presentations in a broad array of communications-related technologies, including networking and wireless communication. I have also developed and taught over 100 courses related to communications and computer systems, including several courses on signals and systems, LTE, OFDM, VoIP, Wi-Fi (802.11), 802.15.4, Zigbee, wireless communication, communications systems, communication interfaces and standards, sensor networks, source coding and compression, network security, computer systems design, game and app design, and computer architecture. These courses have included introductory courses on communication networks and signals and systems, as well as more advanced courses on wireless communications. A complete list of my publications and the courses I have developed and/or taught is also contained in my *curriculum vitae*.

13. My professional affiliations include services in various professional organizations and serving as a reviewer for a number of technical publications, journals, and conferences. I have also received a number of awards and recognitions, including the IEEE Professionalism Award (2008), UNT College of Engineering Outstanding Teacher Award (2008), and Tech Titan of the Future (2010) among others, which are listed in my *curriculum vitae*.

14. I have also served as an expert in certain legal proceedings. A list of cases in which I have testified at trial, hearing, or by deposition (including those during the past five years) is provided in my *curriculum vitae*. Over the years, I have been retained by both plaintiffs as well as defendants.

15. I am being compensated for my work in this case at my standard rate of \$695 per hour (plus reimbursement for expenses) in connection with my preparation of this report, as well

as for each hour spent providing deposition or testimony. This compensation is not contingent upon my performance, the outcome of this case, or any issues involved in or related to this case. I have no financial interest in this matter.

III. MATERIALS RELIED UPON IN FORMING MY OPINIONS

16. In preparing my opinions, I have reviewed the '686 and '726 patents and their prosecution histories, and have also reviewed the other documents and materials cited herein.

17. My opinions are also based upon my education, training, research, knowledge, and personal and professional experience.

IV. CLAIM CONSTRUCTION PRINCIPLES

18. I am not an attorney. Counsel for IV has informed me about several principles and standards of patent law, which I have used in developing my opinions expressed herein.

19. I have been informed that the claims of a patent define the scope of the invention and the patentee's rights. I have been told that patent claims generally should be interpreted consistent with their plain and ordinary meaning as would have been understood by persons of ordinary skill in the art, after reviewing the patent claim language, the specification, and the prosecution history (i.e., the intrinsic record). In this regard, I have also been told that, in order to determine the proper meaning of a disputed claim term, I first look to the claim language itself, the specification, and the prosecution history.

20. I have been informed that a single claim term should be construed consistently with its appearance in other places in the same claim or in other claims of the same patent, unless it is clear from the specification and prosecution history that the terms have different meanings at different portions of the claims.

21. I have been informed, as a general rule, that unless a patent applicant shows an intent to limit their invention, particular examples or embodiments discussed in the specification are not to be read into the claims as limitations. I have also been told that the construction that stays true to the claim language and most naturally aligns with the patent's description of the invention will be the correct construction.

22. I have been informed that extrinsic evidence outside the patent and prosecution history, such as expert testimony, treatises and dictionaries, may also be considered as an aid in arriving at the proper construction of a claim when a claim term is ambiguous.

23. I have been informed that 35 U.S.C. § 112 ¶ 6 (pre-AIA, now § 112(f)) states that “[a]n element in a claim for a combination may be expressed as a means or step for performing a specified function without the recital of structure, material, or acts in support thereof, and such claim shall be construed to cover the corresponding structure, material, or acts described in the specification and equivalents thereof.” I have also been informed that when a claim uses the phrase “means for” to describe a limitation, it is presumed that § 112 ¶ 6 applies. Similarly, I understand that if a claim term does not use the word “means,” there is a rebuttable presumption that 35 U.S.C. § 112, ¶ 6 does not apply to that claim term. I understand that when a claim term lacks the word “means,” the presumption can be overcome and § 112, ¶ 6 will apply if the challenger demonstrates that the claim term fails to recite sufficiently definite structure or else recites function without reciting sufficient structure for performing that function. When that presumption is rebutted, I have been informed that that a “means-plus-function” limitation must be construed to cover the corresponding structure, material, or acts described in the specification and equivalents thereof.

24. I have been informed that the procedure for construing a “means-plus-function” claim limitation involves first defining the function of the limitation, and then identifying the corresponding structure for that function. I have been informed that the function of a means-plus-function limitation is construed to include the limitations contained in the claim language, and only those limitations. Further, I have been informed that the corresponding structure is identified by looking at the specification and prosecution history of the patent. However, structure disclosed in the specification or the prosecution history is considered “corresponding” structure only if the specification or prosecution history clearly links or associates that structure to the function recited in the claim. I have been informed that a bare statement that known techniques or methods can be used does not disclose structure, even if a person of skill in the art would be capable of implementing a structure.

V. LEVEL OF ORDINARY SKILL IN THE ART

25. I have been informed that there is a concept in patent law known as a person having ordinary skill in the art (“POSITA”). I have been informed that this concept refers to a person who is trained in the relevant technical field of a patent without possessing extraordinary or otherwise exceptional skill. Further, I have been informed that factors such as the education level of those working in the field, the sophistication of the technology, the types of problems encountered in the art, prior art solutions to those problems, and the speed at which innovations are made may help establish the level of skill in the art.

26. Taking these factors into consideration, it is my opinion that a person having ordinary skill in the art at the time the earliest applications for the ’686 and ’726 patents were filed would have had a bachelor’s degree in electrical engineering, computer engineering, computer

science, or a related field, and one to two years of experience in the design or development of networking systems, or the equivalent. Additional graduate education could substitute for professional experience, or significant experience in the field could substitute for formal education.

27. Based on my qualifications described above, I was at least a POSITA at the time the earliest applications for the '686 and '726 patents were filed. My opinions herein are from the perspective of a POSITA as of that date.

VI. OVERVIEW OF '686 AND '726 PATENTS

28. The '686 patent is titled "Dynamically Modifying The Resources Of A Virtual Server." It was filed September 19, 2011 and issued December 31, 2013. It claims priority to Application Priority Date May 11, 2000.

29. The '726 patent is titled "Dynamically Modifying The Resources Of A Virtual Server." It was filed January 9, 2008 and issued September 20, 2011. It claims priority to Application Priority Date May 11, 2000.

30. The specifications of the '686 and '726 patents are substantively identical, and have several overlapping claim terms. To the extent that a particular claim term that I address in this Declaration spans more than one patent, for ease of administration any patent specification citations are limited to only one patent, as indicated, with the understanding that the corresponding identical disclosure in any other applicable patent is cited by implication.

VII. THE '686 AND '726 PATENTS DISPUTED CLAIM TERMS**A. “determination that a virtual server is overloaded” ('686 patent claims 5-7)**

Plaintiffs' Proposed Construction	Defendant's Proposed Construction
Plain and ordinary meaning	“determination that an average number of resource denials for a virtual server is beyond a pre-configured threshold” <i>See also</i> construction of “resource denials”

31. In my opinion the term virtual server is a well-known and commonly used term among those of skill in the art and means exactly what it says; a virtual server. An overload in the context of a virtual server is equally well understood and is further explained by the language of the claim itself, that it is based on resource unavailability messages generated from denied requests to modify a resource allocation.

B. “determining that a second physical host can accommodate the requested modified resource allocation” ('686 patent claims 5-7)

Plaintiffs' Proposed Construction	Defendant's Proposed Construction
Plain and ordinary meaning, in the alternative “determining that a second physical host can accommodate the requests by the virtual server that could not be immediately serviced”	Indefinite, or in the alternative “determining that a second physical host can accommodate the denied request to modify a resource allocation”

32. In my opinion when the claim is read in its entirety and in light of the specification, the scope of the disputed term is readily apparent to one of skill in the art, in that the claim element immediately preceding the disputed term refers to “denied requests to modify a resource allocation.” As the specification discloses what a denied request to modify a resource allocation in, how to monitor for it, and gives at least one embodiment complete with exemplary algorithms, one of skill in the art would be clearly informed that the disputed term refers back to this denied request to modify a resource allocation, and therefore, would understand that the claimed second

physical host would be required to have sufficient resources to satisfy the previously requested and denied resource allocation.

C. '686 patent "component" terms of claim 7

- 1. [7.B] "a component configured to receive an indication that a first physical host is overloaded, wherein the indication is based on a determination that a virtual server is overloaded and wherein the determination that a virtual server is overloaded is based on one or more resource unavailable messages resulting from denied requests to modify a resource allocation"**

33. In my opinion the claimed indication is the current physical host load on 160A received from the physical host resource monitor 540 compared to the request for additional resources 510 by virtual server 162B. Combined with the flow diagrams in Figures 2A and 2B, as well as the structural limitations of the claim itself, one of skill in the art would be guided by sufficient disclosure to understand what structure performs the claimed function. *See* '686 patent, Figs. 1 and 5 and corresponding specification.

- 2. [7.C] "a component configured to determine that a second physical host can accommodate the requested modified resource allocation"**

34. In my opinion, the specification describes in detail how the physical host load balancer 130 and the load-balancing calculator 530 perform the claimed function. The structure corresponding to the claimed function includes the load-balancing calculator 530, which is within the physical host load balancing module 130 contained within the dynamic resource configuration module 100. When viewed in light of the easiest fit heuristic formula, the flow diagrams in Figures 2A and 2B, as well as the structural limitations of the claim itself, one of skill in the art would be guided by the sufficient disclosure to understand what structure performs the claimed function. *See* '686 patent, Figs. 1 and 5 and corresponding specification.

3. **[7.D] “a component configured to generate a physical host transfer signal that indicates a second physical host and to transfer the virtual server from the first physical host to the second physical host if the first physical host is overloaded”**

35. In my opinion, the structure that Defendants have proposed for this term is too narrow and incomplete. More specifically, it does not account for the portion of the claimed function “generate a physical host transfer signal.” The correct structure for performing the entire claimed function, in my opinion also includes at least load balancing module 130 and load balancing calculator 530, in combination with virtual server resource monitor 120 and physical host resource monitor 540, which are components of dynamic resource configuration module 100. See ’686 patent, Figs. 1 and 5 and corresponding specification.

D. ’726 patent claims 1, 4 & 5

36. In my opinion one of ordinary skill in the art would be well-informed of the structure of the elements from the claim language and specification disclosures. If the Court finds that § 112 ¶ 6 applies then it is my opinion that each disputed element has sufficient corresponding structure identified either in the claim itself, specification or both.

1. **[1.A], [4.A], [5.B] “a virtual server resource monitor [communicatively coupled to the first physical host and] configured to monitor resource denials and to send a virtual server overloaded signal in response to the resource denials”**

37. In my opinion one of ordinary skill in the art would know from the claims and specification disclosure that there are any number of different ways to intercept systems calls, and resource denials can be accounted for and an overload may be determined in ways other than storing the denials in individual tables and using a pre-specified time window.

2. **[1.B], [4.B], [5.C] “a virtual server resource modifier [communicatively coupled to the first physical host and] configured to receive the virtual server overloaded signal and, in response to the virtual server**

overloaded signal, to modify a resource allocation for the virtual server and to send a virtual server resource modification signal”

38. In my opinion, not only is the virtual server resource modifier part of the disclosed structure, but the structure additionally includes dynamic resource configuration module 100 and the virtual servers. One of ordinary skill in the art would understand the dynamic resource configuration module 100 is not a “black box,” but rather, is a well-known component that plays a part in performing the claimed function. *See* ’726 patent, Fig. 1 and corresponding specification.

3. **[1.C], [4.C], [5.D] “a load balancing module [communicatively coupled to the plurality of physical hosts and] configured to receive the virtual server resource modification signal and to determine whether the first physical host is overloaded and, in response to a determination that the first physical host is overloaded, to send a physical host transfer signal that indicates a second physical host”**

39. In my opinion a person of skill in the art would understand the structure that performs this function to include the physical hosts 160A-C and virtual servers 162A-C. This is supported by the specification disclosure as contributing to the claimed function, as seen in Figure 5 and the related description. Additionally, as the physical host load balancing module is part of the dynamic resource configuration module 100, and includes the physical host resource monitor 540 and load balancing calculator 530, each of these components should be considering part of the corresponding structure. *See* ’726 patent, Figs. 1 and 5 and corresponding specification.

4. **[1.D], [4.D], [5.E] “a dynamic virtual server mover [communicatively coupled to the plurality of physical hosts and] configure to receive the physical host transfer signal and, in response to the physical host transfer signal, to transfer the virtual server from the first physical host to the second physical host” / “the dynamic virtual server mover is further configured to direct the first physical host to store, in the file system, a set of system files for the virtual server and to direct the second physical host to access, from the file system, the set of system**

files for the virtual server, thereby transferring the virtual server from the first physical host to the second physical host”

40. In my opinion one of ordinary skill in the art would know from the claims and specification disclosure that physical servers, virtual machines and dynamic resource configuration module 100 are each structural elements that are part of performing the claimed function. Further, the specification describes physical host load balancer 130 as using the dynamic virtual server mover 140 to transfer virtual servers between hosts, indicating that the load balancer is used, in part, to perform the claimed function. One of skill in the art would understand from the specification’s disclosures that the “make, then break” and “break, then mark” methods of transfer are not the only methods for transferring virtual servers. *See* ’726 patent, Fig. 1 and corresponding specification.

I declare under penalty of perjury that the foregoing is true and correct.

Dated: March 27, 2020

Signed:

A handwritten signature in blue ink, appearing to read "Robert Akil", is written over a solid black horizontal line.

Dr. Robert Akil, D.Sc.

APPENDIX A

Robert Akl, D.Sc.



Professional Summary

Dr. Akl has over 25 years of industry and academic experience. He is currently a Tenured Associate Professor at the University of North Texas and a Senior Member of IEEE. He has designed, implemented, and optimized both hardware and software aspects of several wireless communication systems for CDMA, Wi-Fi, and sensor networks. Dr. Akl has broad expertise in wireless communication, Bluetooth, CDMA/WCDMA network optimization, GSM, LTE, VoIP, telephony, computer architecture, and computer networks. He is a very active researcher and is well published and cited. He has been awarded many research grants by leading companies in the industry and the National Science Foundation. He has developed and taught over 100 courses in his field. Dr. Akl has received several awards and commendation for his work, including the 2008 IEEE Professionalism Award and was the winner of the 2010 Tech Titan of the Future Award.

Dr. Akl has extensive experience with patents in the wireless and networking industry. In the past ten years, he has worked as a technical expert in dozens of patent related matters, involving thousands of hours of research, investigation, and study. He has repeatedly been qualified as an expert by Courts, and has provided numerous technology tutorials to Courts, and given testimony by deposition and at trial. He has worked with companies large and small, both for and against the validity and infringement of patents, and has also helped counsel and Courts to understand technology that often seems complex. In doing so, he has become familiar with, and actively worked with, the legal principles that underlie patentability and validity and claim interpretation in the wireless and networking industries.

Areas of Expertise

2G, 3G, 4G, 5G, CDMA/WCDMA, GPS, GSM, UMTS, LTE, Ad-hoc Networks, Antenna Design, Bluetooth, Call Admission Control, Channel Coding, Compression, Computer Architecture, MIMO Systems, Multi-cell Network Optimization, Packet-networks, Telephony, VoIP, Wi-Fi, Wireless Communication, Wireless Sensors.

Education

<u>Year</u>	<u>College/University</u>	<u>Degree</u>	<u>GPA</u>
2000	Washington University in Saint Louis	D.Sc. in Electrical Engineering	4.0 / 4.0
1996	Washington University in Saint Louis	M.Sc. in Electrical Engineering	4.0 / 4.0
1994	Washington University in Saint Louis	B.Sc. in Electrical Engineering	4.0 / 4.0
1994	Washington University in Saint Louis	B.Sc. in Computer Science	4.0 / 4.0

Graduated *summa cum laude* and ranked first in undergraduate class.

Dissertation: "Cell Design to Maximize Capacity in Cellular Code Division Multiple Access (CDMA) Networks." Advisors: Dr. Manju Hegde and Dr. Paul Min.

Litigation Support and Expert Witness Experience

- L1. 2020 **Prince Lobel Tye LLP**
Case: Intellectual Ventures I and II LLC, v. VMware, Inc.
Western district of Texas, Austin division, Case No. 1:19-cv-01075-ADA
Matter: Patent infringement, networking systems
Project: Declaration to support claim construction
- L2. 2020 **Faegre Baker Daniels LLP**
Case: CommScope, Inc., v. Rosenberger Technology, et al.
District of New Jersey, Case No. 19-cv-15962-MCA-LDW
Matter: Trade secret software, base station antenna design
Project: Declaration, deposition
- L3. 2020 **Ropes & Gray LLP**
Case: Canon, Inc. v. TCL Electronics Holdings Ltd., et al.
Eastern district of Texas, Marshal division, Case No. 2:18-cv-546-JRG
Matter: Patent infringement, communication interfaces
Project: Declaration to support claim construction, deposition
- L4. 2019 **Perkins Coie LLP**
Case: Huizhou TCL Mobile Communication Co. Ltd., TCT Mobile (US) Inc., and TCL Mobile Communication (HK) Co., Ltd. v. Wi-LAN Inc.
IPR2020-00302, IPR2020-00303
Matter: *Inter Partes* Review, QoS enhancements for wireless IP networks
Project: Two declarations to support two IPR petitions
- L5. 2019 **K & L Gates LLP**
Case: EVS CODEC Technologies, LLC and Saint Lawrence Communications, LLC v. ZTE Corporation, et al.
Northern district of Texas, Dallas division, Case No. 3:19-cv-00385-M-BH
Matter: Patent infringement, EVS, speech compression, coding and decoding
Project: Invalidity expert report
- L6. 2019 **Feinberg Day Alberti Lim & Belloli LLP**
Case: Uniloc 2017 LLC v. AT&T Mobility LLC, et al.
Eastern district of Texas, Marshal division, Case No. 2:18-cv-00514-JRG
Matter: Patent infringement, wireless frequency bands and devices
Project: Two declarations to support claim construction, deposition

- L7. 2019 **Ropes & Gray LLP**
Case: Huawei Technologies Co. Ltd. v. Harris Global Communications, Inc.
IPR2019-01512, IPR2019-01631
Matter: *Inter Partes* Review, routing and security in wireless networks
Project: Two declarations to support two IPR petitions
- L8. 2019 **Ropes & Gray LLP**
Case: Harris Corporation v. Huawei Device USA, Inc. et al.
Eastern district of Texas, Marshal division, Case No. 2:18-cv-00439-JRG
Matter: Patent infringement, routing and security in wireless networks
Project: Declaration to support claim construction
- L9. 2019 **Erise IP**
Case: Semcon IP Inc. v. ASUSTeK Computer Inc.
Eastern district of Texas, Marshal division, Case No. 2:18-cv-00193-JRG
Matter: Patent infringement, adaptive power control
Project: Non-infringement expert report
- L10. 2019 **Cooley LLP**
Case: Facebook Inc. v. BlackBerry Corp. et al.
Northern District of California, Oakland division, Case No. 4:18-cv-05434-JSW
Matter: Patent infringement, mobile computing
Project: Declaration to support claim construction
- L11. 2019 **Sidley Austin LLP**
Case: Semcon IP Inc. v. Amazon.com, Inc.
Eastern district of Texas, Marshal division, Case No. 2:18-cv-00192-JRG
Matter: Patent infringement, adaptive power control
Project: Expert report regarding patent marking, rebuttal report regarding patent marking, deposition
- L12. 2019 **Oblon, McClelland, Maier & Neustadt, LLP**
Case: MV3 Partners LLC v. Roku, Inc.
Western district of Texas, Waco division, Case No. 6:18-cv-308-ADA
Matter: Patent infringement, mobile set top box
Project: Declaration to support claim construction, deposition, Markman hearing testimony
- L13. 2019 **Banner & Witcoff, LTD.**
Case: Kathrein USA, Inc. v. Fractus S.A.
IPR2019-00954, IPR2019-00955, IPR2019-00956, IPR2019-00957
Matter: *Inter Partes* Review, multiband antenna arrays

- Project: Four declarations to support four IPR petitions
- L14. 2019 **Fish & Richardson, P.C.**
Case: LG Electronics Inc. v. Saint Lawrence Communications LLC
Southern district of New York, Case No. 1:18-cv-11082-DLC
Matter: Patent infringement, EVS, speech compression, coding and decoding
Project: Declaration relating to motion for summary judgment, expert report, deposition
- L15. 2019 **Ropes & Gray LLP**
Case: SIPCO, LLC v. Emerson Electric Co.
In the Matter of Certain Wireless Mesh Networking Products and Related Components Thereof, ITC Investigation No. 337-TA-1131
Matter: Patent infringement, links in wireless networks and remote monitoring
Project: Source code review, declaration to support claim construction, invalidity expert report, rebuttal expert report regarding non-infringement and no domestic industry
- L16. 2019 **Fish & Richardson, P.C.**
Case: Maxell Ltd. v. Huawei Technologies Co. Ltd., ZTE, et al.
Eastern district of Texas, Texarkana division, Case No. 5:18-cv-0033-RWS
Matter: Patent infringement, portable computing devices
Project: Declaration regarding claim construction
- L17. 2019 **Ropes & Gray LLP**
Case: Emerson Electric Co. v. SIPCO, LLC
IPR2019-00548, IPR2019-00549
Matter: *Inter Partes* Review, routing in wireless networks
Project: Two declarations to support two IPR petitions
- L18. 2018 **Mishcon de Reya New York LLP**
Case: ChanBond, LLC v. Atlantic Broadband Group, LLC, et al.
District of Delaware, Case No. 1:15-cv-00842-RGA
Matter: Patent infringement, wideband signal distribution system
Project: Validity expert report, deposition, sur-reply expert report, second sur-reply expert report, second deposition
- L19. 2018 **Fish & Richardson, P.C.**
Case: In re: Qualcomm Antitrust Litigation (Client: Apple)
Southern district of California, Case No. 3:17-cv-00108-GPC-MDD
Matter: Qualcomm antitrust litigation
Project: Two expert rebuttal reports, deposition

- L20. 2018 **Susman Godfrey LLP**
Case: In re: Qualcomm Antitrust Litigation (Client: Class Action)
 Northern district of California, Case No. 5:17-md-02773-LHK
Matter: Qualcomm antitrust litigation
Project: Expert declaration on standard essential patents, expert report on
 deemed essential patents, rebuttal expert report, deposition
- L21. 2018 **284 Partners**
Case: Federal Trade Commission. v. Qualcomm Incorporated
 Northern district of California, Case No. 5:17-cv-00220
Matter: Qualcomm antitrust litigation
Project: Expert report on standard essential patents, expert rebuttal report,
 deposition
- L22. 2018 **Vorys, Sater, Seymour and Pease LLP**
Case: Routel Inc. v. Airwatch LLC
 District of Delaware, Case No. 17-331-RGA
Matter: Patent infringement, remote access
Project: Source code review, declaration regarding claim construction,
 infringement expert report, validity expert report, reply expert report,
 deposition, three declarations regarding re-exam
- L23. 2018 **Sidley Austin LLP**
Case: Samsung Electronics Co., Ltd v. Huawei Technologies Co., Ltd.
 IPR2017-01471, IPR2017-01474, IPR2017-01475
Matter: *Inter Partes* Review, 4G/LTE
Project: Three declarations to support three Patent Owner responses,
 supplemental declaration, deposition
- L24. 2018 **Fitzpatrick Cella Harper & Scinto**
Case: IPC Systems, Inc. v. Cloud9 Technologies, LLC
 District of Delaware, Case No. 16-cv-443-GMS
Matter: Patent infringement, telephone stations and trading turrets
Project: Source code review, declaration regarding claim construction,
 supplemental declaration regarding claim construction
- L25. 2018 **Haynes and Boone, LLP**
Case: LG Electronics Inc., et al. v. Wi-LAN Inc., et al.
 IPR2018-00673, IPR2018-00674, IPR2018-00704, IPR2018-00705,
 IPR2018-00709, IPR2018-00710
Matter: *Inter Partes* Review, bandwidth allocation
Project: Six declarations to support six IPR petitions, two depositions, two
 reply declarations

- L26. 2018 **Pillsbury Winthrop Shaw Pittman LLP**
Case: Cellular Communications Equipment v. ZTE, HTC Corporation, et al.
Eastern district of Texas, Case No. 6:16-cv-475-RWS
Matter: Patent infringement, LTE, power control, emergency notification
Project: Invalidity expert report, deposition
- L27. 2018 **Finnegan Henderson Farabow Garrett & Dunner LLP**
Case: FanDuel, Inc. DraftKings, Inc., and Bwin.Party Digital Entertainment
PLC. v. CG Technology Development, LLC
IPR2017-00902, IPR2017-01333, IPR2017-01491, IPR2017-01532
Matter: *Inter Partes* Review, location-based gaming
Project: Four declarations to support four Patent Owner responses, two
supplemental declarations, four depositions
- L28. 2018 **Calfee, Halter & Griswold LLP**
Case: Hytera Communications Corp. Ltd. v. Motorola Solutions, Inc.
Northern district of Ohio, Case No. 1:17-cv-01794-DNC
Matter: Patent infringement, two-way radios
Project: Source code review, declaration regarding claim construction, rebuttal
declaration regarding claim construction, deposition, infringement
expert report
- L29. 2017 **Covington & Burling LLP**
Case: Sharp Corporation, et al. v. Hisense Co., Ltd., et al.
In the Matter of Certain Wi-Fi Enabled Electronic Devices and
Components Thereof, ITC Investigation No. 337-TA-1072
Matter: Patent infringement, Wi-Fi, OFDMA
Project: Declaration regarding claim construction
- L30. 2017 **Vorys, Sater, Seymour and Pease LLP**
Case: Airwatch LLC and VMWare Inc. v. Route1 Inc.
IPR2017-02145
Matter: *Inter Partes* Review, remote access
Project: Declaration to support Patent Owner response
- L31. 2017 **Simpson Thacher & Bartlett LLP**
Case: XR Communications, LLC. v. Ubiquiti Networks, Inc.
Central district of California, Case No. 2:17-cv-02968-AG(JCGx)
Matter: Patent infringement, Wi-Fi and adaptive antennas
Project: Declaration regarding claim construction, deposition
- L32. 2017 **Covington & Burling LLP**
Case: Huawei Device USA Inc. v. Hitachi Maxell, Ltd.
IPR2018-00209, IPR2018-00210
Matter: *Inter Partes* Review, base station selection, GPS/Cellular location
Project: Two declarations to support two IPR petitions

- L33. 2017 **Calfee, Halter & Griswold LLP**
Case: Hytera Communications Corp. Ltd. v. Motorola Solutions, Inc.
IPR2018-00128, IPR2017-02183
Matter: *Inter Partes* Review, two-way radios
Project: Declaration to support IPR petition, deposition, two supplemental
declarations, two depositions
- L34. 2017 **Finnegan Henderson Farabow Garrett & Dunner LLP**
Case: Hytera Communications Corp. Ltd. v. Motorola Solutions, Inc.
IPR2017-02179, IPR2017-02183
Matter: *Inter Partes* Review, two-way radios
Project: Two declarations to support two IPR petitions, deposition
- L35. 2017 **Mayer Brown LLP**
Case: Silver Spring Networks, Inc. v. Sunrise Technologies, Inc.
Silver Spring Networks, Inc. v. Weatherproof Wireless, LLC
IPR2017-*To Be Assigned*, IPR2017-*To Be Assigned*
Matter: *Inter Partes* Review, power meter
Project: Two declarations to support two IPR petitions
- L36. 2017 **Covington & Burling LLP**
Case: Hitachi Maxell, Ltd. v. Huawei Device USA Inc. et al.
Eastern district of Texas, Texarkana division, Case No. 5:16-cv-
00178-RWS
Matter: Patent infringement, 3G/4G
Project: Source code review, declaration regarding claim construction,
invalidity expert report, non-infringement expert report, non-
infringing alternatives expert report, two depositions
- L37. 2017 **Finnegan Henderson Farabow Garrett & Dunner LLP**
Case: LG Electronics, Inc. et al. v. BLU Products, Inc. and CT Miami, LLC
In the Matter of Certain LTE Wireless Communication Devices and
Components Thereof, ITC Investigation No. 337-TA-1051
Matter: Patent infringement, 4G/LTE
Project: Declaration regarding claim construction, second declaration
regarding claim construction
- L38. 2017 **Sidley Austin LLP**
Case: Huawei Technologies Co., Ltd. v. Samsung Electronics Co., Ltd.
IPR2017-01979, IPR2017-01980, IPR2017-01986
Matter: *Inter Partes* Review, 4G/LTE
Project: Three declarations to support three IPR petitions, deposition

- L39. 2017 **Finnegan Henderson Farabow Garrett & Dunner LLP**
Case: Motorola Solutions, Inc. v. Hytera Communications Corp. Ltd. et al.
In the Matter of Certain Two-way Radio Equipment Systems, Related Software and Components Thereof, ITC Investigation No. 337-TA-1053
Matter: Patent infringement, two-way radio
Project: Source code review, declaration regarding claim construction, invalidity expert report, non-infringement expert report, deposition, ITC hearing testimony
- L40. 2017 **Haynes and Boone, LLP**
Case: Rackspace US, Inc. v. Realtime Data LLC
IPR2017-01691
Matter: *Inter Partes* Review, data compression
Project: Declaration to support IPR petition
- L41. 2017 **Pillsbury Winthrop Shaw Pittman LLP**
Case: ZTE (USA), HTC Corporation, et al. v. Cellular Communications Equipment
IPR2017-01508, IPR2017-01509
Matter: *Inter Partes* Review, LTE, power control, emergency notification
Project: Two declarations to support two IPR petitions, two depositions
- L42. 2017 **Alston & Bird LLP; Womble Carlyle Sandridge & Rice LLP**
Case: Itron, Inc. and Duke Energy Corp. v. Smart Meter Technologies
IPR2017-01199
Matter: *Inter Partes* Review, power meter
Project: Declaration to support IPR petition, deposition
- L43. 2017 **Haynes and Boone, LLP**
Case: Ericsson Inc. v. Regents of the University of Minnesota
IPR2017-01186, IPR2017-01200, IPR2017-01213
Matter: *Inter Partes* Review, OFDM and MIMO
Project: Three declarations to support three IPR petitions
- L44. 2017 **Quinn Emanuel Urquhart & Sullivan, LLP**
Case: GENBAND US, LLC v. Metaswitch Networks Ltd, et al.
Eastern district of Texas, Marshal division, Case No. 2:16-cv-582-JRG-RSP
Matter: Patent infringement, Internet protocols and VoIP
Project: Expert report regarding essentiality
- L45. 2017 **Mayer Brown LLP**
Case: Uniloc USA, Inc. et al. v. Avaya Inc., ShoreTel, Inc., et al.
Eastern district of Texas, Tyler division, Case Nos. 6:15-cv-1168-JRG
Matter: Patent infringement, instant messaging and conference calling

- Project: Source code review, non-infringement consulting
- L46. 2017 **Fish & Richardson P.C.**
Case: Nokia Solutions and Networks US LLC, et al. v. Huawei Technologies Co. Ltd., et al.
Eastern district of Texas, Marshal division, Case Nos. 2:16-cv-753-JRG-RSP, 2:16-cv-754
Matter: Patent infringement, 4G/LTE
Project: Claim construction, two declarations
- L47. 2017 **Rothwell Figg Ernst & Manbeck, PC; Pepper Hamilton LLP**
Case: Samsung Electronics, et al. v. Rembrandt Wireless Technologies, LP IPR2015-00555
Matter: *Ex Parte* Reexamination, Bluetooth
Project: Two declarations to support two Patent Owner responses, supplemental declaration to support Patent Owner reply
- L48. 2016 **Sidley Austin LLP**
Case: Huawei Technologies Co., et al. v. Samsung Electronics Co, et al. and Samsung Research America v. Hisilicon Technologies Co, LTD
Northern district of California, San Francisco division, Case No. 3:16-cv-2787-WHO
Matter: Patent infringement, 3G/4G/LTE
Project: Source code review, declaration regarding claim construction, declaration opposing summary judgement, infringement expert report, invalidity expert report, non-infringement expert report, validity expert report, two depositions
- L49. 2016 **Bragalone Conroy PC**
Case: Securus Technologies, Inc. v. Global Tel*Link Corporation
CBM2017-00034
Matter: Covered Business Method Review, call monitoring and recording
Project: Declaration to support CBM petition, deposition
- L50. 2016 **Braxton, Hilton & Perrone PLLC**
Case: Biosonix, LLC. v. Hydrowave, LLC et al.
Eastern district of Texas, Case No. 2:16-cv-139-RC
Matter: Patent infringement, underwater transceivers
Project: Claim construction, Markman hearing testimony
- L51. 2016 **Gray Reed & McGraw**
Case: Optis Cellular Technology, LLC and PanOptis Patent Management, LLC. v. Blackberry Corporation, et al.
Eastern district of Texas, Marshal division, Case No. 2:16-cv-59-JRG-RSP, Case No. 2:16-cv-61-JRG-RSP, Case No. 2:16-cv-62-JRG-RSP
Matter: Patent infringement, LTE

- Project: Claim construction, three declarations regarding claim construction, deposition
- L52. 2016 **Ropes & Gray LLP; Davidson Berquist Jackson & Gowdey**
Case: SIPCO, LLC et al v. Emerson Electric Co. et al
Eastern district of Texas, Tyler division, Case No. 6:15-cv-907
Emerson Electric Co. et al v. SIPCO, LLC et al.
Northern district of Georgia, Atlanta division, Case No. 1:15-cv-00319-AT
Matter: Patent infringement, links in wireless networks and remote monitoring
Project: Source code review, invalidity consulting
- L53. 2016 **EIP US LLP**
Case: GENBAND US, LLC et al. v. Metaswitch Networks Ltd
IPR2015-01456, IPR2015-01457
Matter: *Inter Partes* Review, media gateways
Project: Two declarations to support Patent Owner responses, two depositions
- L54. 2016 **Haynes and Boone, LLP**
Case: Cox Communications, Inc. v. AT&T Intellectual Property I, II, LP
IPR2015-01187, IPR2015-01227, IPR2015-01273, IPR2015-01536
Matter: *Inter Partes* Review, cable networks
Project: Four declarations to support Patent Owner responses, four depositions
- L55. 2016 **Mayer Brown LLP**
Case: Odyssey Wireless v. Motorola Mobility LLC
Eastern district of North Carolina, Western division, Case No. 5:14-cv-491-D
Southern district of California, Case No. 3:15-cv-01741-H-RBB
Matter: Patent infringement, LTE
Project: Source code review, non-infringement consulting
- L56. 2016 **Cooley LLP; Finnegan LLP**
Case: Saint Lawrence Comm. LLC v. Motorola Mobility LLC, ZTE (USA) Inc., et al.
Eastern district of Texas, Marshal division, Case No. 2:15-cv-000351-JRG, Case No. 2:15-cv-000349-JRG
Matter: Patent infringement, speech compression, coding and decoding
Project: Invalidity expert report, expert report regarding AMR-WB standard, expert report regarding Opus and Silk, supplemental expert report regarding invalidity, two-day depositions, jury trial testimony for Motorola

- L57. 2015 **Sidley Austin LLP**
Case: Evolved Wireless, LLC v. Microsoft Corp., et al.
District of Delaware, Case No. 15-cv-546
Matter: Patent infringement, LTE
Project: Prior art and invalidity consulting
- L58. 2015 **McKool Smith**
Case: Optis Wireless Technology, LLC and PanOptis Patent Management, LLC. v. ZTE Corporation and ZTE (USA) Inc.
Eastern district of Texas, Marshal division, Case No. 2:15-cv-300-JRG-RSP
Matter: Patent infringement, cellular messages and multimedia attachments
Project: Source code review, claim construction, declaration
- L59. 2015 **Fish & Richardson, P.C.**
Case: Saint Lawrence Comm. LLC v. LG Elec., Inc. et al.
Eastern district of Texas, Marshal division, Case No. 2:14-cv-1055-JRG
Matter: Patent infringement, speech compression, coding and decoding
Project: Invalidity expert report
- L60. 2015 **Finnegan Henderson Farabow Garrett & Dunner LLP**
Case: LG Electronics, Inc. v. Cellular Communications Equipment LLC
IPR2016-00178
Matter: *Inter Partes* Review, LTE
Project: Declaration to support IPR petition
- L61. 2015 **McKool Smith**
Case: AT&T, et al. v. Cox Communication, Inc., et al.
District of Delaware, Case No. 14-1106-GMS
Matter: Patent infringement, cable networks
Project: Claim construction, declaration
- L62. 2015 **McKool Smith**
Case: Ericsson Inc., et al. v. TCL Communication, et al.
Eastern district of Texas, Marshal division, Case No. 2:15-cv-00011-RSP
Matter: Patent infringement, wireless devices and systems
Project: Source code review, claim construction, declaration, infringement expert report, validity expert report, two-day depositions
- L63. 2015 **Foley & Lardner LLP**
Case: Kyocera Communications, Inc. v. Cellular Communications Equipment LLC
IPR2015-01559, IPR2015-01564
Matter: *Inter Partes* Review, LTE, power control, emergency notification

- Project: Two declarations to support two IPR petitions
- L64. 2015 **Fish & Richardson, P.C.**
Case: Fairfield Industries Inc. v. Wireless Seismic, Inc.
Southern district of Texas, Case No. 4:14-cv-02972-KPE
Matter: Patent infringement, wireless sensor networks
Project: Non-infringement expert report
- L65. 2015 **Quinn Emanuel Urquhart & Sullivan, LLP**
Case: GENBAND US, LLC v. Metaswitch Networks Ltd, et al.
Eastern district of Texas, Marshal division, Case No. 2:14-cv-33-JRG-RSP
Matter: Patent infringement, Internet protocols and VoIP
Project: Expert report regarding essentiality, non-infringement expert report, rebuttal expert report regarding non-practice, supplemental rebuttal expert report, three-day depositions, jury trial testimony
- L66. 2015 **Duane Morris LLP; Foley & Lardner LLP**
Case: Mobile Telecommunications Technologies, LLC v. Leap Wireless International, Cricket Communications, Inc.
Eastern district of Texas, Marshal division, Case No. 2:13-cv-00885-RSP
Matter: Patent infringement, OFDM and MIMO
Project: Non-infringement expert report, deposition
- L67. 2015 **Hogan Lovells US LLP; Kenyon & Kenyon LLP**
Case: One-E-Way v. Beats Electronics, LLC, Sony Corporation, et al.
In the Matter of Certain Wireless Headsets, ITC Investigation No. 337-TA-943
Matter: Patent infringement, wireless communication
Project: Claim construction, declaration
- L68. 2015 **McKool Smith**
Case: Solocron Media, LLC v. AT&T Inc., et al.
Eastern district of Texas, Marshal division, Case No. 2:13-cv-1059-JRG
Matter: Patent infringement, ringtone download
Project: Claim construction, invalidity expert report
- L69. 2015 **EIP US LLP**
Case: Good Technology Software, Inc. v. Mobile Iron, Inc.
IPR2015-00833, IPR2015-00836, IPR2015-01090
Matter: *Inter Partes* Review, software management in wireless devices
Project: Three declarations to support three IPR petitions

- L70. 2015 **McKool Smith**
Case: AirWatch LLC v. Good Technology Corp
 Northern district of Georgia, Case No. 1:14-cv-02281-SCJ
Matter: Patent infringement, software management in wireless devices
Project: Claim construction, declaration
- L71. 2015 **Simpson Thacher & Bartlett LLP**
Case: IXI Mobile (R&D) Ltd. et al. v. Apple Inc.
 Southern district of New York, Case No. 14-cv-7594-RJS
Matter: Patent infringement, PDA and Bluetooth
Project: Invalidity consulting
- L72. 2014 **Bragalone Conroy PC**
Case: Global Tel*Link Corporation v. Securus Technologies, Inc.
 IPR2014-00785, IPR2014-00810, IPR2014-00824, IPR2014-00825,
 IPR2014-01278, IPR2014-01282, IPR2014-01283
Matter: *Inter Partes* Review, VoIP call monitoring and recording, allocating
 telecommunication resources and information systems
Project: Seven declarations to support seven Patent Owner responses, five
 depositions
- L73. 2014 **Orrick, Herrington & Sutcliffe LLP**
Case: Shopkick, Inc. v. Novitaz, Inc.
 IPR2015-00277, IPR2015-00278
Matter: *Inter Partes* Review, wireless customer service management
Project: Two declarations to support two IPR petitions
- L74. 2014 **Paul Hastings LLP**
Case: Cellular Communications Equipment LLC v. AT&T, et al.
 Eastern district of Texas, Tyler division, Case No. 6:13-cv-507-LED
 (Lead Case for Consolidation)
Matter: Patent infringement, 3G cellular communication
Project: Claim construction, declaration
- L75. 2014 **Baker Botts LLP**
Case: Orlando Communications LLC v. AT&T, et al.
 M.D. Florida, Case No. 6:14-cv-01021
Matter: Patent infringement, 3G/4G cellular communication
Project: Non-infringement and claim construction consulting
- L76. 2014 **EIP US LLP**
Case: Good Technology Software, Inc. v. AirWatch, LLC
 IPR2015-00248, IPR2015-00875
Matter: *Inter Partes* Review, software management in wireless devices
Project: Two declarations to support two IPR petitions

- L77. 2014 **Bragalone Conroy PC**
Case: Securus Technologies, Inc. v. Global Tel*Link Corporation
IPR2015-00153, IPR2015-00155, IPR2015-00156
Matter: *Inter Partes* Review, VoIP call monitoring and recording
Project: Three declarations to support three IPR petitions, two depositions
- L78. 2014 **Andrews Kurth LLP**
Case: Sony Mobile Communications (USA) v. Adaptix Inc.
IPR2014-01524, IPR2014-01525
Matter: *Inter Partes* Review, subcarrier selection in LTE
Project: Two declarations to support two IPR petitions, deposition
- L79. 2014 **Step toe & Johnson LLP; Baker & McKenzie LLP**
Case: VTech Communications, Inc. and Uniden America Corporations v. Spherix Incorporated
IPR2014-01432
Matter: *Inter Partes* Review, IP telephony
Project: Declaration to support IPR petition, deposition, reply declaration, deposition
- L80. 2014 **Step toe & Johnson LLP; Baker & McKenzie LLP**
Case: Spherix Inc. v. VTech Telecommunications Ltd., et al.
Spherix Inc. v. Uniden Corp, et al.
Northern district of Texas, Dallas Division, Case No. 3:13-cv-3494 and 3:13-cv-3496
Matter: Patent infringement, IP telephony
Project: Claim construction, declaration, deposition
- L81. 2014 **McKool Smith**
Case: Good Technology Corp. v. MobileIron, Inc.
Northern district of California, Case No. 5:12-cv-05826-PSG
Matter: Patent infringement, software management in wireless devices
Project: Claim construction, three declarations, claim invalidity expert report, non-infringement expert report, deposition, jury trial testimony
- L82. 2014 **Lee & Hayes**
Case: Broadcom Corp. v. Ericsson, Inc.
IPR2013-00601, IPR2013-00602, and IPR2013-00636
Matter: *Inter Partes* Review, ARQ protocols
Project: Three declarations to support Patent Owner responses, two declarations to support Patent Owner Motion to Amend, deposition, two reply declarations
- L83. 2014 **Sidley Austin LLP**
Case: Adaptix, Inc. v. Huawei Technologies Co., et al.
Eastern district of Texas, Case No. 6:13-cv-00438, 439, 440 and 441

- Matter: Patent infringement, subcarrier selection in LTE
Project: Non-infringement consulting, source code review
- L84. 2014 **Finnegan Henderson Farabow Garrett & Dunner LLP**
Case: Cell and Network Selection LLC v. Huawei Technologies Co., et al.
Eastern district of Texas, Case No. 6:13-cv-00404-LED-JDL
Matter: Patent infringement, base station selection in LTE
Project: Non-infringement consulting
- L85. 2014 **Feinberg Day Alberti & Thompson LLP**
Case: DSS Technology Management, Inc. v. Apple Inc.
Eastern district of Texas, Tyler division, Case No. 6:13-cv-00919-JDL
Matter: Patent infringement, PDA and Bluetooth
Project: Claim construction and invalidity consulting
- L86. 2014 **Sheppard Mullin Richter & Hampton LLP**
Case: Digcom Inc. v. ZTE (USA), Inc.
District of Nevada, Case No. 3:13-cv-00178-RCJ-WGC
Matter: Patent infringement, cellular communication
Project: Claim construction consulting
- L87. 2014 **Lott & Fischer**
Case: Zenith Electronics, LLC, et al. v. Craig Electronics, Inc.
Southern district of Florida, Case No. 9:13-cv-80567-DMM/DLB
Matter: Patent infringement, HDTV transmission and reception
Project: Opening expert report regarding nonessentiality
- L88. 2013 **McKool Smith**
Case: Zenith Electronics, LLC, et al. v. Curtis International Ltd.
Southern district of Florida, Case No. 9:13-cv-80568-DMM/DLB
Matter: Patent infringement, HDTV transmission and reception
Project: Claim construction, declaration, deposition
- L89. 2013 **Gibson Dunn**
Case: Straight Path IP Group v. Sharp Corp. and Sharp Electronics Corp.
In the Matter of Certain Point-to-Point Network Communication
Devices and Products Containing Same, ITC Investigation No. 337-
TA-892
Matter: Patent infringement, point-to-point network communication
Project: Non-infringement consulting
- L90. 2013 **Kilpatrick Townsend & Stockton LLP; Cooley LLP**
Case: Monec Holding AG v. Motorola Mobility LLC, HTC, et al.
District of Delaware, Case No. 1:11-cv-798-LPS-SRF
Matter: Patent infringement, displaying books on tablets

- Project: Non-infringement expert report for Motorola, non-infringement expert report for HTC, deposition
- L91. 2013 **Gartman Law Group**
Case: Lone Star WiFi LLC v. Legacy Stonebriar Hotel, Ltd; et al.
Eastern district Of Texas, Tyler, Case No. 6:12-cv-957
Matter: Patent infringement, levels of access in Wi-Fi networks
Project: Claim validity consulting
- L92. 2013 **White & Case, LLP**
Case: Nokia Corp and Nokia, Inc. v. HTC Corp and HTC America, Inc.
In the Matter of Certain Portable Electronic Communication Devices,
Including Mobile Phones and Components Thereof, ITC Investigation
No. 337-TA-885
Matter: Patent infringement, App download and installation
Project: Non-infringement consulting
- L93. 2013 **Heim, Payne & Chorush, LLP**
Case: Rembrandt Wireless v. Samsung Electronics Co., et al.
Eastern district of Texas, Marshal, Case No. 2:13-cv-213-JRG-RSP
Matter: Patent infringement, Bluetooth
Project: Expert report regarding validity, deposition, jury trial
- L94. 2013 **Baker Hostetler; Davis Polk & Wardwell LLP**
Case: Comcast v. Sprint; and Nextel Inc.
Eastern district of Pennsylvania, Case No. 2:12-cv-00859-JD
Matter: Patent infringement, SMS/MMS in Cellular Networks
Project: Infringement expert report, validity expert report, reply expert report,
declaration, two-day depositions, jury trial testimony
- L95. 2013 **McKool Smith**
Case: Samsung Electronics America v. Ericsson Inc.
In the Matter of Certain Wireless Communications Equipment and
Articles Therein, ITC Investigation No. 337-TA-866
Matter: Patent infringement, LTE uplink and downlink
Project: Prior art research, source code review, claim construction, claim
invalidity expert report, non-infringement expert report, ITC hearing
testimony
- L96. 2012 **DLA Piper US LLP**
Case: CSR Technology Inc. v. Freescale Semiconductor, Inc.
USDC-San Francisco, Case No. 3:12-cv-02619-RS
Matter: Patent infringement, radio transceivers
Project: Claim construction, declaration

- L97. 2012 **Fish & Richardson P.C.**
Case: GPNE Corp. v. Apple, Inc.; et al.
 USDC-ND California, Case No. 5:12-cv-02885-LHK
Matter: Patent infringement, resource allocation in wireless networks
Project: Prior art research consulting
- L98. 2012 **Polsinelli Shughart PC**
Case: Single Touch Interactive, Inc. v. Zoove Corporation
 Northern district of California, Case No. 3:12-cv-00831-JSC
Matter: Patent infringement, abbreviated dialing, information delivery
Project: Claim construction, Markman hearing testimony, two declarations
- L99. 2012 **K & L Gates**
Case: EON Corp. IP Holdings, LLC v. Novatel Wireless, Inc.; et al.
 DC-Tyler, Texas, Case No. 6:11-cv-00015-LED-JDL
Matter: Patent infringement, wireless modem and 3G services
Project: Non-infringement expert report, deposition
- L100 2012 **Simpson Thacher & Bartlett LLP**
Case: CSR Technology, Inc. v. Bandspeed, Inc.
 Western district of Texas, Case No. 1:12-cv-297-LY
Matter: Patent infringement, packet identification in 2.4 GHz and 5 GHz
Project: Source code review, Markman hearing testimony, infringement expert report
- L101 2012 **Sheppard Mullin Richter & Hampton LLP**
Case: Wi-LAN v. HTC America, Inc., et al.
 Eastern district of Texas, Case No. 6:10-cv-521-LED
Matter: Patent infringement, CDMA, Orthogonal Codes
Project: Source code review, non-infringement expert report, deposition, jury trial testimony
- L102 2012 **Dechert LLP**
Case: Hitachi v. TPV and Vizio, Inc.; and Vizio v. Hitachi, LTD.
 Eastern district of Texas, Case No. 2:10-cv-260
Matter: Patent infringement, HD television transmission and reception
Project: Prior art research, claim invalidity consulting
- L103 2012 **Fish & Richardson P.C.; Covington & Burling; Alston & Bird; Brinks Hofer Gilson & Lione**
Case: InterDigital Commc'n, LLC v. Huawei Tech. Co. LTD; LG Electronics, Inc.; Nokia, Inc.; and ZTE (USA) Inc.
 Certain Wireless Devices With 3G Capabilities and Components Thereof, ITC Investigation No. 337-TA-800
Matter: Patent infringement, channel coding in UMTS, HSDPA
Project: Non-infringement consulting

- L104 2012 **Fish & Richardson P.C.; Covington & Burling; Alston & Bird; Brinks Hofer Gilson & Lione**
Case: InterDigital Commc'n, LLC v. Huawei Tech. Co. LTD; LG Electronics, Inc.; Nokia, Inc.; and ZTE (USA) Inc.
District of Delaware, Case No. 1:11-cv-00654-UNA
Matter: Patent infringement, channel coding in UMTS, HSDPA
Project: Non-infringement consulting
- L104 2011 **O'Melveny & Myers LLP**
Case: MobileMedia Ideas, LLC v. Apple, Inc.
District of Delaware, Case No. 1:10-cv-00258-SLR-MPT
Matter: Patent infringement, voice control, call rejection in mobile phones
Project: Source code review, prior art research, declaration, claim invalidity expert report, non-infringement expert report, deposition, jury trial testimony
- L104 2011 **Wilmer Cutler Pickering Hale and Dorr**
Case: Apple, Inc. v. Samsung Electronics Co.
Northern district of California, Case No. 5:11-cv-01846-LHK
Matter: Patent infringement, channel coding in CDMA, E-AGCH, TFCI
Project: Prior art research, claim construction consulting
- L104 2011 **Weil, Gotshal & Manges LLP**
Case: Vizio, Inc. v. Renesas Electronics America, Inc.
ITC Investigation No. 337-TA-789
Matter: Patent infringement, HD television transmission and reception
Project: Claim invalidity consulting
- L104 2011 **Shapiro Cohen**
Case: TenXc Wireless Inc. v. Andrew LLC
TenXc Wireless Inc. v. Mobi Antenna Technologies Ltd.
Matter: Patent infringement, antenna design, sectorized cellular network
Project: Claim validity consulting
- L105 2010 **Fish & Richardson P.C.**
Case: Vizio, Inc., v. LG Electronics, Inc.
ITC Investigation No. 337-TA-733
Matter: Patent infringement, HD television transmission and reception
Project: Claim charts, claim construction expert report, deposition
- L110 2010 **Fish & Richardson P.C.**
Case: Vizio, Inc., v. LG Electronics, Inc.
District of Maryland, Case No. 1:09-cv-1481-BEL
Matter: Patent infringement, HD television transmission and reception
Project: Claim charts, claim construction expert report, deposition

- L111 2008 **Kaye Scholer LLP**
Case: eBay Inc. v. IDT.
 Western district of Arkansas, Case No. 4:08-cv-4015-HFB
Matter: Patent infringement, long distance communication using Internet
Project: Prior art research, claim construction consulting
- L112 2008 **Simpson Thacher & Bartlett LLP**
Case: Commil USA, LLC v. Cisco Systems, Inc.
 Eastern district of Texas, Case No. 2:07-cv-00341-DF-CE
Matter: Patent infringement, two-level wireless protocol
Project: Prior art research
- L113 2006 **Woodfill and Pressler**
Case: Charles Russell v. Interinsurance Exchange of the Auto Club
 Harris County, Texas, Case No. 2005-19706
Matter: House fire and insurance claim
Project: Determining user location using cellular phone records, expert report,
 deposition, jury trial testimony

Consulting History

- From: 1/2013 **Heim, Payne & Chorush, LLP**
To: 3/2013 Houston, TX
Duties: Analyze patents on wireless technologies.
- From: 4/2007 **Collin County Sheriff's Office**
To: 5/2007 McKinney, TX
Duties: Analyzed cellular record data and determined user location in a double-homicide investigation.
- From: 4/2004 **Allegiant Integrated Solutions**
To: 5/2004 Fort Worth, TX
Duties: Designed and developed an integrated set of tools for fast deployment of wireless networks. The tools optimize the placement of Access Points and determine their respective channel allocations to minimize interference and maximize capacity.
- From: 3/2002 **Input/Output Incorporated**
To: 4/2002 New Orleans, LA
Duties: Designed and implemented an algorithm in MATLAB for optimizing the frequency selection process used by sonar for scanning the bottom of the ocean.
- From: 6/1998 **Teleware Corporation**
To: 7/1998 Seoul, South Korea

Duties: Designed and developed a software package for analyzing the capacity in a CDMA network to maximize the number of subscribers.

Employment History

From:	1/2015	University of North Texas
To:	Present	Denton, TX
Position:	<i>Associate Chair of Graduate Studies Department of Computer Science and Engineering</i>	
	In charge of all administrative duties related to the Master's and Ph.D. programs in the department.	
From:	5/2008	University of North Texas
To:	Present	Denton, TX
Position:	<i>Tenured Associate Professor Department of Computer Science and Engineering</i>	
	Conducting research on cellular networks and wireless sensor networks. Teaching wireless communication courses. Advising graduate and undergraduate students.	
From:	9/2002	University of North Texas
To:	5/2008	Denton, TX
Position:	<i>Assistant Professor Department of Computer Science and Engineering</i>	
	Conducting research on WCDMA/UMTS wireless networks. Teaching wireless communication and computer architecture courses. Advising graduate and undergraduate students.	
From:	1/2002	University of New Orleans
To:	8/2002	New Orleans, LA
Position:	<i>Assistant Professor Department of Electrical Engineering</i>	
	Designed and taught two new courses "Computer Systems Design I and II". Developed a Computer Engineering Curriculum with strong hardware-design emphasis. Formed a wireless research group. Advised graduate and undergraduate students.	
From:	10/2000	Comspace Corporation
To:	12/2001	Coppell, TX
Position:	<i>Senior Systems Engineer</i>	
	Designed, coded (in Matlab), and simulated Viterbi decoding, Turbo coding, trellis coded modulation (TCM), and Reed-Muller codes. Optimized soft decision parameters and interleavers for additive white Gaussian and Rayleigh faded channels. Extended the control and trunking of push-to-talk Logic Trunked Radio (LTR) to include one-to-one and one-to-many voice and data messaging.	

From: 8/1996 **MinMax Corporation**
To: 8/2000 Saint Louis, MO
Position: *Research Associate*
Designed software packages that provide the tools to flexibly allocate capacity in a CDMA network and maximize the number of subscribers. Analyzed and simulated different audio compression schemes. Validated, simulated (logical and timing), and developed the hardware architecture for an ATM switch capable of channel group switching.

From: 8/1994 **Washington University**
To: 8/2000 Saint Louis, MO
Position: *Research and Teaching Assistant*
Taught, consulted, and graded Circuit Analysis at the undergraduate level and Network Design at the graduate level.

Publications

Conference Proceedings

- C1. U.K. Dey, **R. Akl**, R. Chataut, "High Throughput Vehicular Communication Using Spatial Multiplexing MIMO," *IEEE CCWC 2020 The 10th Annual Computing and Communication Workshop and Conference*, January 2020, paper no. 1570613408, 6 pgs.
- C2. R. Chataut, **R. Akl**, M. Robaei, "Accelerated and Preconditioned Refinement of Gauss-Seidel Method for Uplink Signal Detection in 5G Massive MIMO Systems," *IEEE CCWC 2020 The 10th Annual Computing and Communication Workshop and Conference*, January 2020, paper no. 1570605343, 7 pgs.
- C3. M. Robaei, **R. Akl**, "Examining Spatial Consistency for Millimeter-Wave Massive MIMO Channel Estimation in 5G-NR," *IEEE ICCE 2020 The 38th International Conference on Consumer Electronics*, January 2020, paper no. 1570596880, 6 pages.
- C4. R. Chataut, **R. Akl**, "Channel Gain Based User Scheduling for 5G Massive MIMO Systems," *IEEE HONET-ICT 2019 The 16th International Conference on Smart Cities: Improving Quality of Life Using ICT & IoT and AI*, October 2019, paper no. 1570565594, 5 pgs.
- C5. M. Robaei, **R. Akl**, "Time-Variant Broadband mmWave Channel Estimation Based on Compressed Sensing," *IEEE UEMCON 2019 The 10th Annual Ubiquitous Computing, Electronics & Mobile Communication Conference*, October 2019, paper no. 1570577430, 7 pages.
- C6. R. Chataut, **R. Akl**, U. Dey, "Least Square Regressor Selection Based Detection for Uplink 5G Massive MIMO Systems," *IEEE WAMICON 2019 The 20th Annual*

- IEEE Wireless and Microwave Technology Conference*, April 2019, paper no. 1570524727, 6 pgs.
- C7. R. Chataut, **R. Akl**, "Huber Fitting Based ADMM Detection for Uplink 5G Massive MIMO Systems," *IEEE UEMCON 2018 The 9th Annual Ubiquitous Computing, Electronics & Mobile Communication Conference*, November 2018, paper no. 1570492416, 5 pgs.
- C8. R. Chataut, **R. Akl**, "Efficient and Low Complex Uplink Detection for 5G Massive MIMO Systems," *IEEE WAMICON 2018 The 19th Annual Wireless and Microwave Technology Conference*, April 2018, paper no. 1570431593, 6 pgs.
- C9. R. Chataut, **R. Akl**, "Optimal Pilot Reuse Factor Based on User Environments in 5G Massive MIMO," *IEEE CCWC 2018 The 8th Annual Computing and Communication Workshop Conference*, January 2018, paper no. 1570413394, 6 pgs.
- C10. S. Alotaibi, **R. Akl**, "Radio Resource Management in LTE Femtocell Networks," *IEEE NCA '17 International Symposium on Network Computing and Applications*, November 2017, paper no. 117, 5 pgs.
- C11. U. Sawant, **R. Akl**, "Subcarrier Allocation in LTE Network Deployment with Mobility," *IEEE UEMCON 2017 8th Annual Ubiquitous Computing, Electronics and Mobile Communication Conference*, October 2017, paper no. 1570349184, 8 pgs.
- C12. S. Alotaibi, **R. Akl**, "Packet Scheduling Bandwidth Type-Based Mechanism for LTE," *IEEE UEMCON 2017 8th Annual Ubiquitous Computing, Electronics and Mobile Communication Conference*, October 2017, paper no. 1570394639, 6 pgs.
- C13. S. Alotaibi, **R. Akl**, "Dynamic Fractional Frequency Reuse (FFR) Scheme for Two-Tier Network in LTE," *IEEE UEMCON 2017 8th Annual Ubiquitous Computing, Electronics and Mobile Communication Conference*, October 2017, paper no. 1570394969, 6 pgs.
- C14. U. Sawant, **R. Akl**, "Evaluation of Adaptive and Non Adaptive LTE Fractional Frequency Reuse Mechanisms," *IEEE WOCC 2017 The 26th Annual Wireless and Optical Communications Conference*, April 2017, paper no. 1570341174, 6 pgs.
- C15. S. Alotaibi, **R. Akl**, "Range-Based Scheme for Adjusting Transmission Power for Femtocells in Co-Channel Deployment," *IEEE WTS 2017 The 16th Annual Wireless Telecommunications Symposium*, April 2017, paper no. 1570334744, 5 pgs.
- C16. U. Sawant, **R. Akl**, "A Novel Metric to Study the Performance of Sectorized Fractional Frequency Reuse Techniques in LTE," *IEEE WTS 2017 The 16th*

- Annual Wireless Telecommunications Symposium*, April 2017, paper no. 1570338498, 7 pgs.
- C17. S. Alotaibi, **R. Akl**, “Dynamic Frequency Partitioning Scheme for LTE HetNet Networks Using Fractional Frequency Reuse,” *IEEE WCNC '17 Wireless Communications and Networking Conference*, March 2017, paper no. 1570332420, 5 pgs., demo and poster.
- C18. U. Sawant, **R. Akl**, “Performance Evaluation of Network Productivity for LTE Heterogenous Networks with Reward-Penalty Weights Assessment,” *IEEE CCWC 2017 The 7th Annual Computing and Communication Workshop Conference*, January 2017, paper no. 1570328396, 6 pgs.
- C19. S. Alotaibi, **R. Akl**, “Self-Adjustment Downlink Transmission Power for Femtocells in Co-Channel Deployment in Heterogeneous Networks,” *IEEE CCWC 2017 The 7th Annual Computing and Communication Workshop Conference*, January 2017, paper no. 1570326815, 6 pgs.
- C20. U. Sawant, **R. Akl**, “Performance Evaluation of Sectorized Fractional Frequency Reuse Techniques Using Novel Metric,” *IEEE ISCC 2016 The Twenty-First IEEE Symposium on Computers and Communications*, June 2016, paper no. 1570275270, 7 pgs.
- C21. R. Tidwell, S. Akumalla, S. Karlaputi, **R. Akl**, K. Kavi, and D. Struble, “Evaluating the Feasibility of EMG and Bend Sensors for Classifying Hand Gestures,” *1st International Conference on Multimedia and Human Computer Interaction*, July 2013, paper no. 63, 8 pgs.
- C22. **R. Akl**, K. Pasupathy, and M. Haidar, “Anchor Nodes Placement for Effective Passive Localization,” *2011 IEEE International Conference on Selected Topics in Mobile and Wireless Networks (iCOST)*, October 2011, paper no. 1569490799, pp. 127 - 132.
- C23. **R. Akl**, P. Kadiyala, and M. Haidar, “Non-Uniform Grid-Based Routing in Sensor Networks”, *9th IEEE Malaysia International Conference on Communications*, December 2009, paper no. 1569243649, pp. 536 - 540.
- C24. M. Haidar, M. Al-Rizzo, Y. Chan, **R. Akl**, M. Bouharras, “Throughput Validation of an Advanced Channel Assignment Algorithm in IEEE 802.11 WLAN”, *ICCSN 2009 – International Conference on Communication Software and Networks*, February 2009, paper no. P385, pp. 801 - 806.
- C25. **R. Akl** and D. Keathly, “Robocamp: Encouraging Young Women to Embrace STEM,” *4th Annual TETC Best Practices Conference*, February 2009, 13 pgs.

- C26. M. Haidar, R. Ghimire, M. Al-Rizzo, **R. Akl**, Y. Chan, "Channel Assignment in an IEEE 802.11 WLAN Based on Signal-to-interference Ratio", *IEEE CCECE – Canadian Conference on Electrical and Computer Engineering: Communications and Networking*, May 2008, paper no. 1569092894, pp. 1169 - 1174.
- C27. H. Al-Rizzo, M. Haidar, **R. Akl**, and Y. Chan, "Enhanced Channel Assignment and Load Distribution in IEEE 802.11 WLANs," *IEEE International Conference on Signal Processing and Communication*, November 2007, paper no. 1569042132, pp. 768 - 771.
- C28. **R. Akl** and Y. Saravanos, "Hybrid Energy-Aware Synchronization Algorithm in Wireless Sensor Networks," *18th Annual IEEE International Symposium on Personal, Indoor and Mobile Radio Communications*, September 2007, paper no 692, 5 pgs.
- C29. M. Haidar, **R. Akl**, and H. Al-Rizzo, "Channel Assignment and Load Distribution in a Power-Managed WLAN," *18th Annual IEEE International Symposium on Personal, Indoor and Mobile Radio Communications*, September 2007, paper no. 463, 5 pgs.
- C30. D. Keathly and **R. Akl**, "Attracting and Retaining Women in Computer Science and Engineering: Evaluating the Results," *Proceedings of American Society for Engineering Education: ASEE Annual Conference*, June 2007, paper no. AC 2007-1229, 10 pgs.
- C31. M. Haidar, **R. Akl**, H. Al-Rizzo, Y. Chan, R. Adada, "Optimal Load Distribution in Large Scale WLAN Networks Utilizing a Power Management Algorithm," *Proceedings of IEEE Sarnoff Symposium*, May 2007, 5 pgs.
- C32. R. Dantu, P. Kolan, **R. Akl**, and K. Loper, "Classification of Attributes and Behavior in Risk Management Using Bayesian Networks," *Proceedings of IEEE Intelligence and Security Informatics Conference*, May 2007, pp. 71-74.
- C33. **R. Akl** and A. Arepally, "Dynamic Channel Assignment in IEEE 802.11 Networks," *Proceedings of IEEE Portable 2007: International Conference on Portable Information Devices*, March 2007, pp 309-313.
- C34. **R. Akl** and U. Sawant, "Grid-based Coordinated Routing in Wireless Sensor Networks," *Proceedings of IEEE CCNC 2007: Consumer Communications and Networking Conference*, January 2007, pp. 860-864.
- C35. **R. Akl** and A. Arepally, "Simulation of Throughput in UMTS Networks with Different Spreading Factors," *Proceedings of IEEE VTC Fall 2006: Vehicular Technology Conference*, September 2006, pp. C1-5.

- C36. A. Alhabsi, H. Al-Rizzo, and **R. Akl**, "Parity Assisted Decision Making for QAM Modulation," *International Conference on Mobile Computing and Wireless Communications*, September 2006, paper no. 1568988776, 5 pgs.
- C37. **R. Akl** and R. Garlick, "Retention and Recruitment of Women in Computer Engineering," *ICEE 2006: International Conference on Engineering Education*, July 2006, paper no. 3318, 5 pgs.
- C38. R. Garlick and **R. Akl**, "Intra-Class Competitive Assignments in CS2: A One-Year Study," *ICEE 2006: International Conference on Engineering Education*, July 2006, paper no. 3325, 5 pgs.
- C39. **R. Akl**, D. Tummala, and X. Li, "Indoor Propagation Modeling at 2.4 GHz for IEEE 802.11 Networks," *WNET 2006: Wireless Networks and Emerging Technologies*, July 2006, paper no. 510-014, 6 pgs.
- C40. P. Chen, K. Kavi, and **R. Akl**, "Performance Enhancement by Eliminating Redundant Function Execution," *Proceedings of IEEE: 39th Annual Simulation Symposium*, April 2006, pp. 143-150.
- C41. **R. Akl** and S. Nguyen, "Capacity Allocation in Multi-cell UMTS Networks for Different Spreading Factors with Perfect and Imperfect Power Control," *Proceedings of IEEE CCNC 2006: Consumer Communications and Networking Conference*, January 2006, vol. 2, pp. 928-932.
- C42. W. Li, K. Kavi, and **R. Akl**, "An Efficient Non-Preemptive Real-Time Scheduling," *18th International Conference on Parallel and Distributed Computing Systems*, Las Vegas, NV, September 2005, pp. 154-160.
- C43. S. Nguyen and **R. Akl**, "Approximating User Distributions in WCDMA Networks Using 2-D Gaussian," *CCCC20T 05: International Conference on Computing, Communications, and Control Technologies*, July 2005, 5 pgs.
- C44. **R. Akl** and S. Park, "Optimal Access Point Selection and Traffic Allocation in IEEE 802.11 Networks," *Proceedings of 9th World Multiconference on Systemics, Cybernetics and Informatics (WMSCI 2005): Communication and Network Systems, Technologies and Applications*, July 2005, vol. 8, pp. 75-79.
- C45. **R. Akl**, M. Naraghi-Pour, M. Hegde, "Throughput Optimization in Multi-Cell CDMA Networks," *IEEE WCNC 2005 - Wireless Communications, and Networking Conference*, March 2005, vol. 3, pp. 1292-1297.
- C46. **R. Akl**, "Subscriber Maximization in CDMA Cellular Networks," *Proceedings of CCCT 04: International Conference on Computing, Communications, and Control Technologies*, August 2004, vol. 3, pp. 234-239.

- C47. **R. Akl** and A. Parvez, "Global versus Local Call Admission Control in CDMA Cellular Networks," *Proceedings of CITSA 04: Communications, Information and Control Systems, Technologies and Applications*, July 2004, vol. 2, pp. 283-288.
- C48. **R. Akl** and A. Parvez, "Impact of Interference Model on Capacity in CDMA Cellular Networks," *Proceedings of SCI 04: Communication and Network Systems, Technologies and Applications*, July 2004, vol. 3, pp. 404-408. Selected as **best paper** of those presented in the session: Tele-Communication Systems, Technologies and Application II.
- C49. **R.G. Akl**, M.V. Hegde, M. Naraghi-Pour, P.S. Min, "Call Admission Control Scheme for Arbitrary Traffic Distribution in CDMA Cellular Systems," *IEEE Wireless Communications and Networking Conference*, September 2000, vol. 1, pp. 465-470.
- C50. **R.G. Akl**, M.V. Hegde, M. Naraghi-Pour, P.S. Min, "Cell Placement in a CDMA Network," *IEEE Wireless Communications and Networking Conference*, September 1999, vol. 2, pp. 903-907.
- C51. **R.G. Akl**, M.V. Hegde, P.S. Min, "Effects of Call Arrival Rate and Mobility on Network Throughput in Multi-Cell CDMA," *IEEE International Conference on Communications*, June 1999, vol. 3, pp. 1763-1767.
- C52. **R.G. Akl**, M.V. Hegde, M. Naraghi-Pour, P.S. Min, "Flexible Allocation of Capacity in Multi-Cell CDMA Networks," *IEEE Vehicular Technology Conference*, May 1999, vol. 2, pp. 1643-1647.

Journal Publications

- J1. S. Alotaibi, **R. Akl**, "Range-Based Scheme for Adjusting Transmission Power of Femtocell in Co-Channel Deployment", *International Journal of Interdisciplinary Telecommunications and Networking*, IJITN Vol. 10, No. 4, pgs. 14-24, 2018.
- J2. U. Sawant, **R. Akl**, "Adaptive and Non Adaptive LTE Fractional Frequency Reuse Mechanisms Mobility Performance", *Advances in Science, Technology and Engineering Systems Journal*, ASTES Vol. 3, No. 3, 02-11, 11 pgs., 2018.
- J3. M. Haidar, H.M. Al-Rizzo, **R. Akl**, and Z. Elbazzal, "The Effect of an Enhanced Channel Assignment Algorithm in an IEEE 802.11 WLAN," *World Scientific and Engineering Academy and Society Transactions on Communications*, WSEAS, Vol. 8, Issue 12, December 2009.
- J4. **R. Akl**, P. Kadiyala, and M. Haidar, "Non-Uniform Grid-Based Coordinated Routing in Wireless Sensor Networks", *Journal of Sensors*, article ID 491349, volume 2009, 11 pages.

- J5. M. Haidar, M. Al-Rizzo, Y. Chan, **R. Akl**, “User-Based Channel Assignment Algorithm in a Load-Balanced IEEE 802.11 WLAN”, *International Journal of Interdisciplinary Telecommunications & Networking (IJITN)*, April-June 2009, 1(2), pp. 66-81.
- J6. **R. Akl**, D. Keathly, and R. Garlick, “Strategies for Retention and Recruitment of Women and Minorities in Computer Science and Engineering,” *iNEER Special Volume: Innovations 2007- World Innovations in Engineering Education and Research*, 9 pgs., 2007.
- J7. R. Garlick and **R. Akl**, “Motivating and Retaining CS2 Students with a Competitive Game Programming Project,” *iNEER Special Volume: Innovations 2007- World Innovations in Engineering Education and Research*, 9 pgs., 2007.
- J8. **R. Akl** and S. Nguyen, “UMTS Capacity and Throughput Maximization for Different Spreading Factors,” *Journal of Networks*, July 2006, vol. 1, issue 3, pp. 40-49. ISSN: 1796-2056
- J9. W. Li, K. Kavi, and **R. Akl**, “A Non-preemptive Scheduling Algorithm for Soft Real-time Systems,” *Journal of Computer and Electrical Engineering*, 2006, vol. 32, 18 pgs. ISSN: 0045-7906
- J10. **R. Akl**, A. Parvez, and S. Nguyen, “Effects of Interference on Capacity in Multi-Cell CDMA Networks,” *Journal of Systemics, Cybernetics and Informatics*, 2006, vol. 3, no. 1, p825612, 7 pgs. ISSN: 1690-4524
- J11. **R.G. Akl**, M. Hegde and M. Naraghi-Pour, “Mobility-based CAC Algorithm for Arbitrary Traffic Distribution in CDMA Cellular Systems,” *IEEE Transactions on Vehicular Technology*, March 2005, vol. 54, no. 2, pp. 639-651.
- J12. **R.G. Akl**, M.V. Hegde, M. Naraghi-Pour, P.S. Min, “Multi-Cell CDMA Network Design,” *IEEE Transactions on Vehicular Technology*, May 2001, vol. 50, no. 3, pp. 711-722.

Technical Papers

- T1. J. Williams, **R. Akl**, et al, “Flight Control Subsystem,” *The Eagle Feather*, Special Section: Undergraduate Research Initiative in Engineering, University of North Texas, Vol. 7, 2010.
- T2. **R.G. Akl**, M.V. Hegde, A. Chandra, P.S. Min, “CDMA Capacity Allocation and Planning,” Technical Document, Washington University Department of Electrical Engineering WUEE-98, April 1998.

Book Chapters

- B1. R. Akl, Y. Saravanos, and M. Haidar, "Chapter 18: Hybrid Approach for Energy-Aware Synchronization in Sensor Networks," *Sustainable Wireless Sensor Networks*, December 2010, pgs. 413-429, ISBN: 978-953-307-297-5.
- B2. K. Kavi, **R. Akl** and A. Hurson, "Real-Time Systems: An Introduction and the State-of-the-Art," *Encyclopedia of Computer Science and Engineering*, John Wiley & Sons, Volume 4, January 2009, pgs. 2369-2377.
- B3. **R. Akl** and K. Kavi, "Chapter 12: Modeling and Analysis using Computational Tools," *Introduction to Queuing Theory: Modeling and Analysis*, Birkhauser Boston, December 2008, pgs. 295-320.

Technical Presentations

- P1. "Bio-Com Project," Raytheon, Richardson TX, May 2012, (invited).
- P2. "Bio-Com Project," Net-Centric Software and Systems I/UCRC Meeting, Denton TX, December 2011, (invited).
- P3. "Student Outreach Report: Robocamp," College of Engineering Advisory Board Meeting, Denton TX, May 2011, (invited).
- P4. "Robocamp: Encouraging Young Women to Embrace STEM," 4th Annual TETC Best Practices Conference, Austin TX, February 2009, (invited).
- P5. "Self-Configuring Wireless MEMS Network (demo)," Southern Methodist University, Dallas TX, January 2008, (invited).
- P6. "Energy-aware Routing and Hybrid Synchronization in Sensor Networks," *Southern Methodist University*, Dallas TX, September 2007, (invited).
- P7. "Retention and Recruitment of Women in Computer Engineering," *ICEE 2006: International Conference on Engineering Education*, Puerto Rico, July 2006, (refereed).
- P8. "Capacity Allocation in Multi-cell UMTS Networks for Different Spreading Factors with Perfect and Imperfect Power Control," *IEEE CCNC 2006: Consumer Communications and Networking Conference*, Las Vegas, NV, January 2006, (refereed).
- P9. "Research, Teaching, and Outreach," CSE Advisory Council Meeting, *UNT Research Park*, Denton, TX, December 2005, (invited).
- P10. "Wi-Fi and WCDMA Network Design," *University of Arkansas*, Little Rock, AR, April 2005, (invited).

- P11. "Wi-Fi and WCDMA Network Design," *Southern Methodist University*, Dallas, TX, March 2005, (invited).
- P12. "Current Research in Wireless at UNT," *Nortel Networks*, Richardson, TX, October 2004, (invited).
- P13. "Subscriber Maximization in CDMA Cellular Networks," *International Conference on Computing, Communications, and Control Technologies*, Austin, TX, August 2004, (refereed).
- P14. "Global versus Local Call Admission Control in CDMA Cellular Networks," *International Conference on Cybernetics and Information Technologies, Systems and Applications*, Orlando, FL, July 2004, (refereed).
- P15. "Impact of Interference Model on Capacity in CDMA Cellular Networks," *8th World Multi-Conference on Systemics, Cybernetics, and Informatics*, Orlando, FL, July 2004, (refereed).
- P16. "CDMA Network Design," *IEEE Communications Society – New Orleans Chapter*, New Orleans, LA, May 2002, (invited).
- P17. "Cell Design to Maximize Capacity in CDMA Networks," *Louisiana State University*, Baton Rouge, LA, April 2002, (invited).
- P18. "Call Admission Control Scheme for Arbitrary Traffic Distribution in CDMA Cellular Systems," *IEEE Wireless Communications and Networking Conference*, Chicago, IL, September 2000, (refereed).
- P19. "Cell Placement in a CDMA Network," *IEEE Wireless Communications and Networking Conference*, September 1999, (refereed).
- P20. "Effects of Call Arrival Rate and Mobility on Network Throughput in Multi-Cell CDMA," *IEEE International Conference on Communications*, June 1999, (refereed).
- P21. "Flexible Allocation of Capacity in Multi-Cell CDMA Networks," *IEEE Vehicular Technology Conference*, May 1999, (refereed).
- P22. "CCAP: A Strategic Tool for Managing Capacity of CDMA Networks," *Teleware Co. Ltd.*, Seoul, South Korea, 1998, (invited).

Courses Developed

- CSCE 5933: LTE Physical Layer Using MATLAB.
Research issues in the design of LTE physical layer and simulate using MATLAB. Topics include modulation and coding, OFDM, channel modeling, MIMO, and link

adaption.

- CSCE 6590: Advanced Topics in Wireless Communications & Networks: 4G/LTE. Research issues in the design of next generation wireless networks: cellular systems, medium access techniques, signaling, mobility management, control and management for mobile networks, wireless data networks, Internet mobility, quality-of-service for multimedia applications, caching for wireless web access, and ad hoc networks.
- CSCE 5933: Fundamentals of VoIP. Fundamentals of VoIP, with emphasis on network infrastructure implementation and security. Topics include IP protocol suite, SS7, speech-coding techniques, quality of service, session initiation protocol, and security issues.
- CSCE 5540: Introduction to Sensor Networks. Topics include: design implications of energy (hardware and software), and otherwise resource-constrained nodes; network self-configuration; services such as routing under network dynamics, localization, time-synchronization and calibration; distributed data management, in-network aggregation and collaborative signal processing, programming tools and language support.
- CSCE 5510. Wireless Communication. Point-to-point signal transmission through a wireless channel, channel capacity, channel encoding, and multi-user transmissions. First, second, and third generation cellular systems, and mobility management.
- CSCE 3510. Introduction to Wireless Communication. Fundamentals of wireless communications and networking, with emphasis on first, second, and third generation cellular systems. Topics include point-to-point signal transmission through a wireless channel, cellular capacity, multi-user transmissions, and mobility management.
- CSCE 3020. Communications Systems. Introduction to the concepts of transmission of information via communication channels. Amplitude and angle modulation for the transmission of continuous-time signals. Analog-to-digital conversion and pulse code modulation. Transmission of digital data. Introduction to random signals and noise and their effects on communication. Optimum detection systems in the presence of noise.
- ENEE 3583. Computer Systems Design I (UNO). The design process of digital computer systems is studied from the instruction set level, system architecture level, and digital logic level. Topics include machine organization, register transfer notation, processor design, memory design, and input/output considerations. Includes semester project.
- ENEE 3584. Computer Systems Design II (UNO).

The design and evaluation of contemporary computer systems are analyzed to compare the performance of different architectures. Topics include performance metrics, computer arithmetic, pipelining, memory hierarchies, and multiprocessor systems.

- ENEE 3514. Computer Architecture Laboratory (UNO).
Selected experiments examining programmable logic, VHDL and logic synthesis, and including a final design project, to accompany and complement the lecture course ENEE 3584. Three hours of laboratory.

Courses Taught

Fall 2019

- CSCE 5933.3: LTE Physical Layer Using MATLAB (no evaluation yet)
- CSCE 6940.743: 5G MIMO Systems (no evaluation done)
- CSCE 6950.743: Dissertation (no evaluation done)

Spring 2019

- CSCE 6940.743: 5G MIMO Systems (no evaluation done)
- CSCE 6940.743: Software Defined Radios (no evaluation done)
- CSCE 6950.743: Dissertation (no evaluation done)

Fall 2018

- CSCE 5933.3: LTE Physical Layer Using MATLAB (4.8 / 5.0)
- CSCE 6940.743: 5G MIMO Systems (no evaluation done)
- CSCE 6950.743: Dissertation (no evaluation done)

Spring 2018

- CSCE 6940.743: 5G MIMO Systems (no evaluation done)
- CSCE 6940.743: Jitter-buffer Management and Interference in VoIP (no evaluation done)
- CSCE 6950.743: Dissertation (no evaluation done)

Fall 2017

- CSCE 5933.3: LTE Physical Layer Using MATLAB (4.9 / 5.0)
- CSCE 6940.743: 5G MIMO Systems (no evaluation done)
- CSCE 6940.743: VoLTE and VoWiFi (no evaluation done)
- CSCE 6950.743: Dissertation (no evaluation done)

Spring 2017

- CSCE 6950.743: Dissertation (no evaluation done)

Fall 2016

- CSCE 5933.3: LTE Physical Layer Using MATLAB (4.7 / 5.0)
- CSCE 6950.743: Dissertation (no evaluation done)

Spring 2016

- CSCE 5950.743: Thesis (no evaluation done)
- CSCE 6950.743: Dissertation (no evaluation done)

Fall 2015

- CSCE 3010.1: Signals and Systems (5.7 / 7.0)
- CSCE 5950.743: Thesis (no evaluation done)

- CSCE 6950.743: Dissertation (no evaluation done)

Spring 2015

- CSCE 5934.743: Directed Study (no evaluation done)
- CSCE 5950.743: Thesis (no evaluation done)
- CSCE 6950.743: Dissertation (no evaluation done)

Fall 2014

- CSCE 3010.1: Signals and Systems (3.32 / 4.00)
- CSCE 5950.743: Thesis (no evaluation done)
- CSCE 6950.743: Dissertation (no evaluation done)
- CSCE 6590.1: Advanced Topics in Wireless Communications & Networks: 4G/LTE (3.79 / 4.00)

Spring 2014

- CSCE 3510.1: Intro to Wireless Communication (808 – Highly Effective)
- CSCE 5510.1: Wireless Communications (808 – Highly Effective)
- CSCE 5950.743: Thesis (no evaluation done)
- CSCE 6950.743: Dissertation (no evaluation done)

Fall 2013

- CSCE 5950.743: Thesis (no evaluation done)
- CSCE 6950.743: Dissertation (no evaluation done)
- CSCE 6590.1: Advanced Topics in Wireless Communications & Networks: 4G/LTE (804 – Highly Effective)

Spring 2013

- CSCE 4890.743: Directed Study (no evaluation done)
- CSCE 5950.743: Thesis (no evaluation done)
- CSCE 6940.743: Individual Research (no evaluation done)
- CSCE 6950.743: Dissertation (no evaluation done)

Fall 2012

- CSCE 3010.1: Signals and Systems (793 – Highly Effective)
- CSCE 5540.1: Intro to Sensor Networks (814 – Highly Effective)
- CSCE 5950.743: Thesis (no evaluation done)
- CSCE 6950.743: Dissertation (no evaluation done)

Spring 2012

- CSCE 3020.1: Communication Systems (809 – Highly Effective)
- CSCE 3510.1: Intro to Wireless Communication (811 – Highly Effective)
- CSCE 5510.1: Wireless Communications (817 – Highly Effective)
- EENG 3810.1: Communication Systems (801 – Highly Effective)

Fall 2011

- CSCE 3010.1: Signals and Systems (793 – Highly Effective)
- CSCE 5540.1: Intro to Sensor Networks (824 – Highly Effective)

Spring 2011

- CSCE 3020.1: Communication Systems (820 – Highly Effective)
- CSCE 3510.1: Intro to Wireless Communication (812 – Highly Effective)
- CSCE 5510.1: Wireless Communications (812 – Highly Effective)
- EENG 3810.1: Communication Systems (826 – Highly Effective)

Fall 2010

- CSCE 3010.1: Signals and Systems (857 – Highly Effective)
- CSCE 5540.1: Intro to Sensor Networks (831 – Highly Effective)

Spring 2010

- CSCE 3020.1: Communication Systems (792 – Highly Effective)
- CSCE 3510.1: Intro to Wireless Communication (793 – Highly Effective)
- CSCE 5510.1: Wireless Communications (834 – Highly Effective)
- EENG 3810.1: Communication Systems (854 – Highly Effective)

Fall 2009

- CSCE 3010.1: Signals and Systems (4.40 / 5.00)
- CSCE 5540.1: Intro to Sensor Networks (4.70 / 5.00)
- EENG 2620.1: Signals and Systems (4.40 / 5.00)

Spring 2009

- CSCE 3020.1: Communication Systems (4.87 / 5.00)
- CSCE 3510.1: Intro to Wireless Communication (4.65 / 5.00)
- CSCE 5510.1: Wireless Communications (4.79 / 5.00)

Fall 2008

- CSCE 3010.1: Signals and Systems (4.91 / 5.00)
- CSCE 5540.2: Intro to Sensor Networks (4.10 / 5.00)
- EENG 2620.3: Signals and Systems (4.91 / 5.00)

Spring 2008

- CSCE 3020.1: Communication Systems (4.68 / 5.00)
- CSCE 3510.1: Intro to Wireless Communication (3.96 / 5.00)
- CSCE 5510.1: Wireless Communications (4.75 / 5.00)

Fall 2007

- CSCE 3010.1: Signals and Systems (4.57 / 5.00)
- CSCE 5540.2: Intro to Sensor Networks (4.01 / 5.00)

Summer 2007

- CSCE 3020.1: Fund. of Communication Theory (no evaluation done)
- EENG 3810.1: Communication Systems (no evaluation done)

Spring 2007

- CSCE 5510.2: Wireless Communications (4.75 / 5.00)
- CSCE 5933.6: Fundamentals of VoIP (4.70 / 5.00)

Fall 2006

- CSCE 3010.1: Signals and Systems (4.58 / 5.00)
- CSCE 5540.1: Intro to Sensor Networks (4.70 / 5.00)
- EENG 2620.1: Signals and Systems (4.58 / 5.00)

Summer 2006

- CSCE 3020.1: Fund. of Communication Theory (no evaluation done)
- CSCE 3510.21: Intro to Wireless Communications (no evaluation done)
- CSCE 5510.21: Intro to Wireless Communications (no evaluation done)
- EENG 3810.1: Communication Systems (no evaluation done)

Spring 2006

- CSCE 2610.2: Computer Organization (3.69 / 5.00)

- CSCE 3010.1: Signals and Systems (4.41 / 5.00)
- EENG 2620.1: Signals and Systems (4.41 / 5.00)

Fall 2005

- CSCE 3510.1: Intro to Wireless Communications (4.52 / 5.00)
- CSCE 5510.1: Wireless Communications (4.46 / 5.00)
- CSCE 5933.6: Intro to Sensor Networks (4.60 / 5.00)

Summer 2005

- CSCE 3010.21: Signals and Systems (no evaluation done)
- CSCE 3510.21: Intro to Wireless Communications (no evaluation done)

Spring 2005

- CSCE 3510.02: Intro to Wireless Communications (4.46 / 5.00)
- CSCI 3100.02: Computer Organization (4.14 / 5.00)

Fall 2004

- CSCE 3510.01: Intro to Wireless Communications (4.15 / 5.00)
- CSCI 4510.01: Machine Structures (4.55 / 5.00)
- CSCI 5330.02: Intro to Wireless Communications (4.05 / 5.00)

Summer 2004

- CSCI 4330.22: Intro to Wireless Communications (no evaluation done)
- CSCI 4330.23: Intro to Wireless Communications (no evaluation done)
- CSCI 5330.22: Intro to Wireless Communications (no evaluation done)

Spring 2004

- CSCI 3100: Computer Organization (4.64 / 5.00)
- CSCI 4330: Intro to Wireless Communications (4.22 / 5.00)

Fall 2003

- CSCI 4510: Machine Structures (4.49 / 5.00)
- CSCI 5330: Intro to Wireless Communications (4.83 / 5.00)

Summer 2003

- CSCI 3100: Computer Organization (no evaluation done)

Spring 2003

- CSCI 3100: Computer Organization (3.84 / 5.00)

Fall 2002

- CSCI 4510: Machine Structures (4.38 / 5.00)

Funded Proposals

- R1. "I/UCRC Industrial Membership - Ashum Corp," 2019. Krishna Kavi (PI), Robert Akl (co-PI), **\$60,900.**
- R2. "I/UCRC Industrial Membership - Ashum Corp," 2018. Krishna Kavi (PI), Robert Akl (co-PI), **\$57,700.**
- R3. "Robotics and App Design Summer Camp" under Texas Higher Education Coordinating Board: Engineering Summer Program. Requested amount is \$11,727. Submitted 5/5/17. Robert Akl (PI), **\$11,727.**

- R4. "I/UCRC Industrial Membership - Ashum Corp," 2017. Krishna Kavi (PI), Robert Akl (co-PI), **\$50,000.**
- R5. "UNT GenCyber Summer Program: Inspiring the Next Generation of Cyber Stars in North Texas," National Security Agency (NSA). Requested amount is \$85,000. Submitted 11/4/2016. Robert Akl (co-PI), **\$85,000.**
- R6. "App Design Summer Camp" under Texas Higher Education Coordinating Board: Engineering Summer Program. Requested amount is \$12,900. Submitted 5/6/16. Robert Akl (PI), **\$12,900.**
- R7. "I/UCRC Industrial Membership - Ashum Corp," 2016. Krishna Kavi (PI), Robert Akl (co-PI), **\$65,000.**
- R8. "Robotics, Game and App Programming Summer Camps" under Texas Workforce Commission: Summer Merit Program. Requested amount is \$63,000. Submitted 11/16/15. Robert Akl (PI), **\$63,000.**
- R9. "App Design Summer Camp" under Texas Higher Education Coordinating Board: Engineering Summer Program. Requested amount is \$13,998. Submitted 5/1/15. Robert Akl (PI), **\$13,988.**
- R10. "I/UCRC Industrial Membership - Ashum Corp," 2015. Krishna Kavi (PI), Robert Akl (co-PI), **\$40,000.**
- R11. "App Design Summer Camp" under Texas Higher Education Coordinating Board: Engineering Summer Program. Requested amount is \$12,500. Submitted 5/2/14. Robert Akl (PI), **\$12,500.**
- R12. "I/UCRC Industrial Membership - Ashum Corp," 2014. Krishna Kavi (PI), Robert Akl (co-PI), **\$46,000.**
- R13. "I/UCRC Industrial Membership - Ashum Corp," 2013. Krishna Kavi (PI), Robert Akl (co-PI), **\$38,500.**
- R14. "Robotics, Game and App Programming Summer Camps" under Texas Workforce Commission: Summer Merit Program. Requested amount is \$63,000. Submitted 12/14/12. Robert Akl (PI), **\$63,000.**
- R15. "Bio-Com Project," funded by Raytheon under Net-Centric Software and Systems I/UCRC 2nd year. Requested amount is \$30,000. Submitted 5/12/12. Krishna Kavi (PI), Robert Akl (co-PI), **\$30,000.**
- R16. "Bio-Com Project," funded by Raytheon under Net-Centric Software and Systems I/UCRC. Requested amount is \$30,000. Submitted 5/12/11. Krishna Kavi (PI),

Robert Akl (co-PI), **\$30,000.**

- R17. "Game Programming for Xbox 360 Summer Camp" under Texas Higher Education Coordinating Board: Engineering Summer Program. Requested amount is \$20,000. Submitted 3/21/11. Robert Akl (PI), **\$20,000.**
- R18. "RoboCamps and Game Programming Summer Camps" under Texas Workforce Commission: Summer Merit Program. Requested amount is \$63,000. Submitted 2/17/11. Robert Akl (PI), **\$63,000.**
- R19. "Game Programming for Xbox 360 Summer Camp" under Texas Higher Education Coordinating Board: Engineering Summer Program. Requested amount is \$13,000. Submitted 2/22/10. Robert Akl (PI), **\$18,000.**
- R20. "Robotics and Game Programming Summer Camps" under Texas Workforce Commission: Summer Merit Program. Requested amount is \$63,000. Submitted 10/16/09. Robert Akl (PI), **\$63,000.**
- R21. "Micro Air Vehicle Design: A Collaborative Undergraduate Project for Electrical Engineering, Computer Engineering, and Computer Science Students," under UNT Undergraduate Research Initiative. Submitted 9/25/2009. Robert Akl (co-PI), **\$8,000.**
- R22. "Summer Merit Program" under Texas Workforce Commission. Requested amount is \$42,000. Submitted 3/20/09. Robert Akl (PI), **\$42,000.**
- R23. "Robocamp at Stewpot" under Dallas Women's Foundation. Requested amount is \$20,000. Submitted 2/23/09. Robert Akl (PI), **\$18,600.**
- R24. "Robocamp Jump Start" under Motorola Foundation Innovation Generation Grant. Requested amount is \$29,852. Submitted 2/12/09. Robert Akl (PI), **\$30,700.**
- R25. "Engineering Summer Program" under Texas Higher Education Coordinating Board. Requested amount is \$7,944. Submitted 2/13/09. Robert Akl (PI), **\$11,111.**
- R26. "Texas Youth in Technology" under Texas Workforce Commission. Requested amount is \$152,393. Submitted 11/10/08. Robert Akl (PI), **\$152,393.**
- R27. "IUCRC Center Proposal: Net-Centric Software and Systems," under NSF-07-537: Industry/University Cooperative Research Centers. Requested amount is \$349,482. Submitted 9/26/08. Krishna Kavi (PI), Robert Akl (co-PI), **\$60,000 per year for 5 years.**
- R28. "Robocamp and Beyond" under Motorola Foundation Innovation Generation Grant. Requested amount is \$30,000. Submitted 6/20/08. Robert Akl (PI),

\$30,000.

- R29. Texas Youth in Technology” under Texas Workforce Commission. Requested amount is \$30,000. Submitted 2/27/08. Robert Akl (PI), **\$31,500.**
- R30. “Robocamp Program for Young Women” under RGK foundation. Requested amount is \$30,000. Submitted 11/5/07. Robert Akl (PI), **\$15,000.**
- R31. “Texas Youth in Technology” under Texas Workforce Commission. Requested amount is \$102,514. Submitted 10/22/07. Robert Akl (PI), **\$102,514.**
- R32. “Women Art Technology” under Hispanic and Global Studies Initiatives Fund. Requested amount is \$14,125. Submitted 9/30/07. Jennifer Way (PI), Robert Akl (co-PI), **\$12,785.**
- R33. “Robocamp Mobile Unit” under Motorola Foundation Innovation Generation Grant. Requested amount is \$35,000. Submitted 6/20/07. Robert Akl (PI), **\$30,000.**
- R34. “ICER: UNT Engineering Challenge Camps” under NSF 0547299. Requested amount is \$35,000. Submitted 4/27/07. Oscar Garcia (PI), Robert Akl (senior personnel), **\$32,792.**
- R35. “IUCRC-Planning Proposal: UNT Research Site Proposal to join Embedded Systems I/UCRC,” under NSF-01-116: Industry/University Cooperative Research Centers. Requested amount is \$10,000. Submitted 3/31/07. Krishna Kavi (PI), Robert Akl (co-PI), **\$10,000.**
- R36. “High-assurance NCCS: Ultra Dependability Integration Engineering,” Department of Defense. Requested amount is \$20,000. Submitted 3/12/07. Krishna Kavi (PI), Robert Akl (co-PI), **\$20,000.**
- R37. “Recruiting and Retention Strategies for Computer Science at UNT” under Texas Technology Workforce Development Grant Program – 2005. Requested amount is \$163,322. Submitted 3/17/05. Robert Akl (PI), **\$125,322.**
- R38. UNT Faculty Research Grant for Fall 2003, Robert Akl (PI), \$5,000, **\$4,000.**
- R39. UNT Junior Faculty Summer Research Fellowship for Summer 2003, Robert Akl (PI), \$5,000, **\$5,000.**

Professional Associations and Achievements

Membership in Professional Organizations

- Senior Member IEEE
- Member, Federation Council of North Texas Universities
- Member, Eta Kappa Nu Electrical Engineering Honor Society
- Member, Golden Key National Honor Society
- Member, Tau Beta Pi Engineering Honor Society

Offices and Committee Assignments in Professional Organizations

- Technical Program Committee Member, IEEE Wireless Communications and Networking Conference, IEEE WCNC
- Technical Program Committee Member, International Wireless Symposium, IWS
- Technical Program Committee Member, IEEE International Conference on Computational Science, IEEE ICCS
- Technical Program Committee Member, IASTED International Conference on Wireless Communications, WC
- Technical Program Committee Member, WTS Wireless Telecommunications Symposium
- Technical Program Committee Member, Mosharaka International Conference on Computer Science and Engineering, Amman
- Invitation to serve as an NSF reviewer/panelist for Engineering Research Centers (ERC) proposals
- Technical Program Committee Member, 18th IEEE International Symposium on Personal, Indoor and Mobile Radio Communication, Greece
- International Program Committee, IASTED International Conference on Wireless and Optical Communication, Canada
- Program Committee Member, Fifth Annual Wireless Telecommunications Symposium, CA
- Technical Publications Chair, IEEE Vehicular Technology Conference, Dallas TX
- Session Chair, International Conference on Computing, Commun. and Control Tech., Austin TX
- Session Chair, International Conference on Cybernetics and Information Technologies, Orlando FL
- Session Chair, 8th World Multi Conference on Systemics, Cybernetic, and Informatics, Orlando FL

Additional Responsibilities and Activities

- Reviewer, *Wireless Communications and Mobile Computing*, 2012 – present
- Reviewer, *Journal of Sensor and Actuator Networks*, 2012 – present
- Reviewer, *IEEE Transactions on Vehicular Technology*, 2011 – present

- Reviewer, *Elsevier Journal of Computers & Electrical Engineering*, 2008 – present
- Reviewer, *IEEE Globecom*, 2007 – present
- Reviewer, *IEEE International Conference on Advanced Networks and Telecommunication Systems (ANTS)*, 2008 – present
- Reviewer, *The International Wireless Communications and Mobile Computing Conference*, 2007 – present
- Reviewer, *Journal on Wireless Communications and Networking*, 2007 – present
- Reviewer, *IEEE Transactions on Communications*, 2007 - present
- Reviewer, *International Journal of Communication Systems*, 2007 – present
- Reviewer, *IEEE Communications Magazine*, 2005 – present
- Reviewer, *Journal of Wireless Networks*, 2004 – present
- Reviewer, *IEEE Transactions on Mobile Computing*, 2004 – present
- Reviewer, *IEEE Transactions on Wireless Communications*, 2004 – present
- Reviewer, *ACM Crossroads*, 2004 – present

Honors and Awards

- Who's Who in America, 2012 Edition
 - Winner of Tech Titan of the Future – University Level Award for UNT Robocamps for Girls, Metroplex Technology Business Council, 2010 with **\$15,000 cash prize**.
 - IEEE Professionalism Award, Ft Worth Chapter, 2008
 - UNT College of Engineering Outstanding Teacher Award, 2008
 - Certificate of Appreciation: IEEE Vehicular Technology Conference, Dallas, TX, 2005
 - Certificate of Appreciation: Denton County Boosting Engineering, Science and Technology (BEST) Robotics Competition, 2004
 - Summa Cum Laude Graduate, Ranked First in Undergraduate Class
 - The Computer Science Departmental Award for Academic Excellence, Washington University, 1993
 - The Dual Degree Engineering Award for Outstanding Senior, Washington University, 1993
 - The 1992 Technical Writing Competition Award, The Society for Technical Communication
-